

EXPERIENCED MATHEMATICS TEACHERS DEVELOPING RESPONSIVE PRACTICES DURING THE
COVID-19 PANDEMIC: A CASE OF PLACE-BASED RESILIENCY

By

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INTRODUCTION

“Thank you. Thank you for listening...just to vent, like, let it out. Because I don't really get to talk to anyone about this kind of stuff.”

-Ezio Martín, middle school mathematics teacher, November 2022

The impetus for this study mirrored the setting and content of the study itself: I found myself in the midst of an unprecedented educational moment at the hands of the COVID-19 pandemic. I felt desperation watching my friends and former colleagues in public schools experience the biggest interruption in the history of United States education. Strangely, as I read news articles, and social media posts, and overheard conversations about teaching and learning, I noticed a striking omission of the voices of the teachers experiencing it. My own background as a mathematics coach led me to care deeply about what *actual* teachers teaching *actual* students had to say, and, as a researcher, I desperately wanted to document and learn from them. In response to the ever-changing landscape of the pandemic, I adapted my own research plans to meet the needs of the time and set out to investigate how well-resourced, experienced mathematics teachers in a large urban region were transforming their teaching during the pandemic. By understanding how these unusually well-resourced teachers pivoted during the lockdown and the educational disruption that followed, I saw an opportunity to understand the nature of teachers' reasoning and the extent to which it is entangled in schools as an institution.

This dissertation is driven by the experiences of eight public school teachers as they navigated teaching during a global pandemic. From study design to methodology to data analysis and findings, I strove to listen to, respond to, attend to, and foreground teachers' voices. Throughout the course of this study, the teachers and I developed a friendly relationship and, like

Ezio Martín in the epigraph, they often spoke of the time and space that our interview conversations afforded them to reflect, speak up, and process their constantly evolving teaching worlds.

In the following chapters, I explore the ways teachers experienced tensions relating to good teaching by capturing their adaptations and responsibilities in a time of disruption. In Chapter 2, I review the literature relevant to the problem space and subsequent analysis, drawing from new institutionalism (Meyer & Rowan, 2006) and theories of teacher learning (Horn & Garner, 2022). Chapter 3 describes the research context and methods of data collection and analysis used, drawing on crisis theories to frame this study as a case of place-based resiliency. I will discuss the inception of a novel interview design, reflexive longitudinal lifeworld interview methodology, the in-process review that it demanded, and the subsequent analysis it afforded.

In the next three chapters, I present the findings of this study, following institutional logics to explore teachers' understanding of their own agency and to better understand the ways they adapted their teaching. Specifically, in Chapter 4, I present an analysis of the ways in which districts across the U.S., to varying degrees, uncoupled (Meyer & Rowan, 2006) as certain institutional logics — such as standardized testing — were temporarily or permanently lifted. Following this shift, I explore the ways in which teachers' institutional commitments, and thus their pedagogical responsibilities, may have also shifted. In particular, I will analyze and discuss the institutional and ethical commitments teachers drew on or negotiated during the duration of this study. Chapter 5 focuses on teachers' vision of good teaching in an analysis of the ways in which teachers' ideas of good teaching led to situational adjustments (or not). In this chapter, I also explore the relationship between teachers' vision of good teaching and their agency to act on and maintain their vision. In the last of my findings chapters (Chapter 6), I extend the

preliminary findings to analyze the ways that the teachers in this study pursued adaptive teaching practices. This chapter will analyze specific changes to practice and the sustainability of such changes.

In the concluding Chapter 7, I discuss the limitations and implications of exploring teachers' responsive practices during the COVID-19 pandemic. I argue that an understanding of the conditions that contributed to place-based resiliency in this study can shape the ways researchers, policymakers, and teacher educators design supportive systems for good teaching.

CHAPTER 1

Literature Review: Good Teaching as a Wicked Problem

“Teaching is a hard enough job as it is. And even before the pandemic last year, being a teacher was not easy. I call it the three-headed monster of lesson planning, grading, and emailing. That, of course, does not include actual teaching.”

–Kasey Zimmerman, high school mathematics teacher, August 2020

Consider a typical secondary mathematics teacher in the United States. Like Kasey Zimmerman, they find that teaching is not an easy job. They might stay at school late catching up on grading or spend their weekends crafting detailed lesson plans to submit for evaluation. They might feel constant pressure to adhere to the department’s strict pacing guide so they will cover all the mathematical standards that their students will be tested on in yearly standardized tests. For most of them, their days are filled with the tension between spending their time and energy responding to the needs of their students or appeasing the three-headed monster Kasey describes in the epigraph.

Now imagine that the external demands on these teachers disappear. They don't have to adhere to mandated grading policies. Students won't take a standardized test at the end of the year. They can select the pacing and order of the mathematical content they teach. In what ways would the tensions that characterize their profession shift? Without the pressures put on them by educational leaders, what would it look like to learn how to be a good teacher?

This study aims to document teachers’ ongoing learning during (or because of) the institutional disruption caused by the COVID-19 pandemic. I define *ongoing teacher learning* as

the continual development of “good teaching” over a teacher’s entire career — whatever good teaching means for them — while recognizing that teachers’ conceptions of good teaching may continually change. Thus, a teacher is learning if they are developing their teaching toward an idea of good teaching that they have, or if their idea of good teaching changes. This broad definition is an intentional move away from a conception of good teaching centered on a change in teacher actions or beliefs or any one specific metric. Instead, this definition of ongoing teacher learning raises a critical question as essential: *What is good teaching?* Do we know what good teaching is? If we do not know or cannot know, how can we support teachers to become good teachers? When bureaucratic structures and normal routines are disrupted, teachers’ answers to this essential question become paramount as they reconstruct their practice. In this chapter, I review the literature on the development of good teaching, highlighting the intersection of good teaching and institutional demands.

1.1 Notions of Good Teaching

The concept of good teaching is widely regarded as “elusive” (Wilson et al., 2005, p. 83) and “contested” (Skelton, 2005, p. 3). Yet the field has a long history of attempting to define, research, teach, and measure good teaching. The result is a mixed bag of teaching terms and definitions: *effective teaching* (Wilson et al., 2005) and *successful teaching* (Fenstermacher & Richardson, 2005) take on a purely achievement-based view of teaching; *best teaching practices* move toward a constructivist theory of teacher effectiveness that focus less on student outcomes and more on teaching activities; *quality teaching* (Fenstermacher & Richardson, 2005) and *teaching models* (Harris, 1998) take into account institutional contexts and the local learning environment; *high-quality teaching* (Bartell, 2004) and *ambitious and equitable instruction*

(Horn & Garner, 2022) represent more personalized and situative views of teaching; *good teaching* (Fenstermacher & Richardson, 2005), *teacher beliefs* (e.g., Nespor, 1987), *teacher perspectives* (e.g., Light & Calkins, 2008), and *teacher visions* (Hammerness, 2004) aim to address how teachers themselves conceptualize good teaching.

In this chapter, I argue that in U.S. public schools, institutional logics of good teaching and teachers' commitments of good teaching are not always aligned. As a result, they do not adequately support mathematics teachers' ongoing learning. I apply Bridwell-Mitchell's (2012) conception of institutional logics to the social and cultural institution of organized U.S. public education. *Institutional logics* are the beliefs, values, norms, and practices associated with core cultural institutions (Bridwell-Mitchell, 2012). The beliefs and values about good teaching embedded in U.S. education policy would be one site of institutional logic. In contrast, I conceptualize *teachers' commitments* to good teaching as teachers' dedications to their own conception of what it means to be a good teacher. During the COVID-19 pandemic, many institutional logics were suspended, allowing teachers' commitments to play a strong role in new iterations of their instructional practice.

To set the stage for my inquiry into mathematics teachers' learning during the disruption of the COVID-19 pandemic, this chapter is organized in the following manner. I first explore the historical context of U.S. education to show that the reform era led to a narrowed, outcomes-oriented institutional logic of good teaching and a tightly coupled institutional environment, resulting in a misalignment between institutional logics and teachers' commitments to good teaching. Next, I show that the tension that stems from this misalignment is well-documented and has professional consequences. However, current solution paths to navigate this tension treat the institution's logics as fixed and straightforward, putting undue responsibility on the teacher to

change. I then review the literature on the development of good teaching to argue that these tensions make for a contradictory learning environment for teachers as they navigate competing (and even conflicting) messages about “good teaching.” Lastly, I offer a different ontological frame to think about good teaching that opens doors for an alignment of conceptions of good teaching among educational policy systems, research systems, and teachers themselves. By grounding this dissertation in an understanding of the interaction between these systems and the teachers within them, I aim to provide a nuanced analysis of teachers’ experiences during the COVID-19 pandemic that has implications beyond teaching and learning during a crisis.

1.2 The Disconnect Between Institutional Logics and Teachers’ Commitments to Good Teaching

1.2.1 Accountability Reform’s Contribution to Institutional Logics

To understand the institutional logics of good teaching, I first explore the recent historical context of U.S. education. In the last two decades of the 20th century, a global rise in neoliberalism led to fears that countries would get left behind in a competitive international economy (Campbell & Pederson, 2001). This resulted in a moral panic (Goldstein, 2015) that affected many U.S. institutions. In 1983, the National Commission on Excellence in Education published a report titled *A Nation at Risk*, which asserted that American schools were not producing workers who could compete in the new economy (Wilgus, 2019). This report marked a shift in the government’s perspective on the purpose of U.S. schooling. Whereas previously the government primarily viewed education as a social institution that aimed to build citizens for democracy, it began to view education as an economic institution (Meyer & Rowan, 2006) whose goal is to produce a globally competitive workforce (Little & Bartlett, 2010).

This shift resulted in a wave of education reforms introducing top-down structures that narrowed ideas of good teaching. Appealing to economic notions of quality control, the first such reform was No Child Left Behind (NCLB; U.S. Congress, 2001), which led to federal accountability measures in the form of mandated annual student standardized testing, with sanctions attached to undesirable student performance outcomes. NCLB's hyper-focus on a narrow form of student achievement represents an *outcomes logic* of good teaching; that is, teachers of students with desirable scores are good teachers, and teachers of students with undesirable scores are not. In 2015, the Every Student Succeeds Act (ESSA; U.S. Congress, 2015) was implemented to maintain and expand the accountability ideas from NCLB. ESSA required states to develop systems of tracking teacher effectiveness through evaluations and monitoring teaching behaviors (U.S. Congress, 2015). To comply, state and local governments developed their own mandatory teacher evaluation systems designed to determine which teachers are teaching "effectively" (Ross & Walsh, 2019), often measured by their students' growth in achievement on state standardized tests or the "value added" by the teacher (Goldhaber, 2002). In value-added measures, student test scores and other variables for individual teachers are used to quantify how much of an effect they have on student learning during the school year. In these ways, NCLB and ESSA introduced a top-down institutional logic of good teaching rooted in a commitment to student outcomes, narrowly defined. This accountability reform era led to a narrow, outcomes-oriented institutional logic of good teaching and a tightly coupled institutional environment, often resulting in a misalignment between institutional and teachers' commitments to good teaching.

1.2.2 Loose versus Tight Coupling in U.S. Education

As U.S. education shifted from a social to an economic institution, the federal government's role changed to exert more control over instruction in ways that limited teacher autonomy. Previously, the relationship between the federal government to state and local educational entities could be best characterized as a loose coupling between teachers and federal policymakers. In *loosely coupled* institutional organizations, those at the bottom of the organizational hierarchy retain substantial autonomy over their work. In these institutions, members at the bottom of the hierarchy would typically behave differently as they make their own choices driven by both institutional and social influences. Relatedly, those at the top of the hierarchy work to structure the organization without necessarily controlling those at lower levels (Meyer & Rowan, 2006).

Before NCLB, U.S. schooling was developed as a loosely coupled social institution; that is, federal and state policymakers did little to control teachers' behaviors. During the pre-accountability era, teachers had the autonomy to decide what and how to teach based on their expertise and local contexts, resulting in widely varied teacher behaviors across states, districts, schools, and even classrooms (Meyer & Rowan, 2006). A teacher in a loosely coupled institution would not be bound by strict standardized testing schedules or standardized content. Instead, their job as a mathematics teacher would involve deciding the amount of time teaching specific mathematical content, in what order, and even what content based on their judgments regarding their students and their teaching environment. Importantly, the autonomy afforded by a loosely coupled educational institution also contributed to a problematic and inequitable education system.

The accountability era of NCLB and ESSA marks a time when the federal government stepped in to control and surveil teachers and schools, an organizational relationship known by institutional analysts as tight coupling. *Tightly coupled* institutional organizations are characterized by tight relations between the top and bottom levels of the organization. Members at the top of the organizational hierarchy set strict parameters dictating the role and actions of members at lower levels, resulting in more uniform behaviors. Tightly coupled government institutions are often considered to be *centralized* governments, where the federal government has tighter control over the lower, more local levels of government. Meyer and Rowan (2006) claim that policies such as NCLB contributed to tighter coupling between federal policymakers and teachers, replacing teacher autonomy with a narrower set of behaviors prescribed in rigid policies that work to maximize educational efficiency. Spillane and Burch (2006) point out that the centralization of standards — resulting in tight coupling of teaching behaviors across classrooms — is particularly salient in mathematics education because of its important role in schools as economic institutions. This move toward tight coupling is characterized by federal government control of mathematical content through sanctions or incentives to adopt standards-based curriculum (Wronowski & Urick, 2021) and the surveillance of teachers through teacher evaluation systems.

In her exploration of teachers' sensemaking as mediating institutional environments and classrooms, Coburn (2004) articulates the possibility for teacher autonomy in tightly coupled institutions. She finds that teachers have *bounded autonomy*, meaning that, although teachers do express some level of autonomy and decision-making when it comes to their practice, the tightly coupled institutional environment places limits on them by creating pressures and contributing to tensions between their local contexts and institutional responsibilities. She argues that teachers

are constantly navigating these tensions in their evolving conception of what constitutes “good practice.”

1.2.3 Emerging Misalignment Between Teachers and Institution

Coburn’s analysis contributes to our understanding of an emerging misalignment between policymakers’ and teachers’ commitments to good teaching. As stated earlier, U.S. schools were originally developed as a social institution (Meyer & Rowan, 2006), and teachers today still enter the profession based on a desire to improve society in some way (Hammerness, 2006). For example, Santoro (2018) describes people becoming teachers for “reasons that could be characterized as moral,” and they remain teachers for the moral rewards. Hammerness (2006) argues that teachers are attracted to the nobility of teaching, which shapes their visions of what they hope to accomplish. Accountability reform-era shifts happened at the federal level, away from social and moral commitments to good teaching, yet the economic panic did not trickle down to teachers who remained steadfast in their moral, ethical, and relational commitments to good teaching. In sum, at the same time the federal government instituted policies committed to a student achievement-oriented, outcome logic of good teaching, a related shift happened in the institutional arrangement of U.S. schools as they grew more tightly coupled. Thus, the outcome-oriented institutional logics of good teaching limited teachers’ autonomy, making room for misalignment between teachers’ commitments to and institutional logics of good teaching. Importantly, this tension may not exist for all teachers; there may be teachers that hold commitments to good teaching that strongly align with institutional logics. This chapter is not intended to contribute to the “all math teachers” discourse, but instead, to make clear the complexity of good teaching as it relates to teacher learning.

1.2.3.1 Misalignment in Mathematics

While these changes affected all subject areas, they have been particularly pronounced in discussions of good *mathematics* teaching because of the distinctive institutional environment built up around public mathematics education (Spillane & Burch, 2006). The structures of U.S. public schooling are such that mathematics is a gatekeeper — to graduation, employment, and opportunity. Yet, U.S. mathematics education has always been characterized by inequitable access to these opportunities based on students' race or gender (Martin et al., 2010). It is because of the stronghold these inequities have on the system of U.S. mathematics education that the issues in this dissertation are amplified in a mathematical context.

Additionally, government agencies have spent more time and resources regulating mathematics and reading/language arts than they have other subjects (U.S. Government Accountability Office, 2018). This is evidenced by the federal focus on the development of the Common Core State Standards in mathematics and language arts (CCSS). Federal control is particularly apparent in the CCSS in mathematics because of the depth and scope of the content the outline for each grade level. The specificity of the mathematical standards has even been present in the public discourse, with parents across the country turning to social media to express their confusion and frustration with “new math.” In contrast, the Next Generation Science Standards (NGSS) — another federally developed set of standards that outline content and scope for K-12 science education — are rarely a topic of public outcry.

In addition to the CCSS, federal programs have been developed to allocate funding to further the Department of Education's mathematical agenda. For example, the competitive grant Race to the Top (U.S. Congress, 2009) program allocated funding for student assessments aligned to the CCSS, and Title 1 and the Eisenhower Mathematics and Science programs award

funding to districts, schools, and teachers based on student test scores and teacher performance in mathematics, science, and English language arts (Spillane & Burch, 2006). In this chapter, I speak specifically to the relationship between the institution of K-12 mathematics education in publicly funded schools and conceptions of good mathematics teaching, since that relationship was partially interrupted during pandemic teaching. The institutional environment characterized by a narrow mathematical agenda (Louie, 2017) contributes to a more obvious tension for mathematics teachers as they develop and rely on their ideas about good teaching.

1.3 Documentation of the Tension of Good Teaching in the Literature

The tensions that result from the misalignment between institutional logics of and teachers' commitments to good teaching are well documented in the literature. Hammerness (2006) refers to such tensions as misalignments between teachers' personal visions and institutional visions. In her interview study of high school teachers, Hammerness (2006) explores *teachers' visions* – the images teachers hold of their ideal classroom and their role in it.

Teachers' visions include how teachers could be interacting with their students, what they and their students could be achieving, and the kind of learning environment in which they and their students could work (Hammerness, 2006). She finds that teachers are often called to navigate tensions between their personal visions and institutional visions.

Horn and Garner (2022) offer the construct of pedagogical responsibility — embedded in a framework for developing pedagogical judgment that I will discuss later in this chapter — that highlights the tensions between teachers' commitments and institutional logics of good teaching. In their framework, they discuss teachers' *concepts*, or teachers' ideas and experiences related to a practice that includes causal narratives, a sense of critical attributes, and a repertoire of related

strategies (Horn & Garner, 2022). Teachers' concepts are more specific than Hammerness' (2006) teacher visions, making way for incoherence as teachers engage with their details in their competing obligations — what Horn & Garner (2022) refer to as *pedagogical responsibility*. Pedagogical responsibility consists of ethical principles (Stengel & Casey, 2013; Tate, 2007) stemming from teachers' moral obligation to center student understandings, as well as institutional commitments that can reflect accountability logic and other policy obligations. Importantly, teachers' ethical principles and institutional commitments are often at odds with each other, contributing to a sense of pedagogical responsibility characterized by tension.

We can see that Horn and Garner (2022) and Hammerness (2006) all draw attention to tensions teachers face when navigating their sense of obligations to themselves and the organization of the institution. Consider a teacher torn between preparing students for the state standardized test by quickly moving through the standards (an institutional obligation) and responding to students' needs when it comes to instructional and pacing decisions (an ethical obligation), resulting in tension between competing pedagogical responsibilities. When looking at this teacher through the lens of teacher visions, the tension between her personal vision — teaching students at a pace that fosters rich conceptual understanding — and the institutional vision — covering all the content that will appear on the state standardized test — is clear as she is thinking ahead to the kind of learning environment she will foster as her school approaches the testing window. Particularly since the early 21st-century reform era, this tension exists when accountability demands and teachers' ethical ideas are at odds.

Similarly, Santoro (2018) explores how teacher attrition is affected by demoralization — the discouragement or despair that comes from unsustainable moral motivations. Like Horn and Garner, she finds that teachers experience and negotiate moral concerns when they feel their

school's policies harm children (tension with the institution) and when teachers feel they have denigrated the profession (tension with a professional element of pedagogical responsibility). When put in conversation with Hammerness' (2006) teacher visions and Horn and Garner's (2022) pedagogical responsibility, Santoro's (2018) work offers additional evidence of the consequences when institutional logics and teachers' commitments to good teaching misalign — especially when the misalignment stems from ethical principles that are core to their identities as teachers.

1.3.1 Consequences of Tensions in Logics: Deprofessionalization and Demoralization

The long-recognized reasons for entering teaching — what Lortie (1975) called the intrinsic rewards and the tradition among teachers from minoritized communities to lift up their communities (Achinstein & Ogawa, 2011; Foster, 1997) — are not well aligned with the economic model of schooling. Because the tightly coupled, economically driven institution of U.S. K-12 public mathematics education has contributed to narrow conceptions of good teaching and hyper-focused student outcomes, the consequences for teachers' engagement and longevity in the profession are inescapable (Wronowski & Urick, 2021).

Categorizing teachers based on their students' achievement scores has contributed to the deprofessionalization of teaching by putting pressure on teachers to teach to a test (Milner, 2013) and introducing a binary — effective vs. ineffective teachers — that has contributed to heightened surveillance of teachers. The student-achievement conceptualization of teaching is reflected in policies that determine hiring decisions and teacher evaluations (e.g., Adnot et al., 2017). For example, Sanders and colleagues' (1997) longitudinal study linking teachers to their students' test scores found that the effectiveness of teachers has more of an influence on student

achievement than any other factor. However, the student achievement measures that this perspective relies on are inherently inequitable (Au, 2009), introducing a cascade of interpretive problems to this measure of teacher “effectiveness.” Importantly, because standardized tests typically emphasize procedural mathematics over conceptual understanding, measures of teacher effectiveness reflected in teacher evaluation systems are also rooted in behaviorist traditions that value students’ rote memorization — and even carceral pedagogies (Bullock, 2019) — over meaningful learning. Not surprisingly, Wronowski and Urick (2021) found that there was a significant increase in teachers’ perceptions of deprofessionalization between 2000 and 2004, during the initial implementation of NCLB.

This centralized institution of mathematics education has also contributed to the demoralization of teachers (Santoro, 2018) by inadequately attending to the abuse of power policymakers have shown in their efforts to control and surveil. Herein lies a key moral dilemma of good teaching: teachers who enter into teaching for reasons that could be characterized as moral (Lortie, 1975; Santoro, 2018) quickly find themselves at odds with an economic institution whose messages of good teaching are fixed, decontextualized, and inflexible. According to Wronowski and Urick (2021), teacher perception of demoralization significantly increased from immediately prior to following NCLB. Hammerness (2006) and Santoro (2018) both argue that moral dilemmas contribute to teacher attrition and the subsequent teacher shortage the U.S. has been experiencing. Specifically, Hammerness (2006) claims that when teachers “believe that their vision is very far from what they are experiencing, they may come to doubt themselves, their schools, their students, and their future as teachers” (p. 2) in what she refers to as feelings of disillusionment and despair. Furthermore, Wronowski and Urick (2021) find that teacher demoralization is highly contextualized at the school level (see also Achinstein & Ogawa, 2006).

Accountability policies intended to uniformly improve student outcomes have a disproportionate effect on the morale of teachers, specifically those in schools with larger percentages of students qualifying for free and reduced-price lunch (Wronowski & Urick, 2021). Perceptions of teachers as “not in it for the money” and instead as “in it for the kids” permeate U.S. society and perpetuate the deprofessionalization of teaching. As Stengel and Casey (2013) put it, “to ignore the demoralization of teaching is to risk the demise of the profession at its best and to risk the loss of its most skilled, most committed members” (p. 188).

1.3.2 Navigating Deprofessionalization and Demoralization

How are teachers navigating the misalignment between their teaching values and the institutional imperatives? In the literature, we see that the burden of this is placed on teachers’ shoulders. For instance, Hammerness (2006) concludes that teachers’ ethical responsibilities can be mediated to align with the institutional vision. Alternatively, Gutiérrez (2016) suggests that teachers can engage in “creative subordination” to maintain their moral vision in spite of institutional demands. Thompson (1992) paints a similar picture of teacher conceptions as Horn’s (2019) pedagogical responsibility: In Thompson’s synthesis of research on teachers’ beliefs and conceptions, she claims that teachers’ models of math teaching may reflect inconsistencies and that these inconsistencies can either be resolved by modifying their beliefs or changing their practice. Likewise, in Hammerness’s (2006) discussion of the tensions between personal and institutional visions, she calls on teachers to change by broadening their range of vision — or even changing to schools that better align with their visions. These suggestions share a focus on *what the teacher does*. While this is arguably sensible advice, it nonetheless puts the onus on teachers to fix what is ultimately a systemic tension. In this way, research addressing

teachers' moral dilemmas operates under the assumption that institutional policies and directives are static and inflexible and cannot be adapted to take into account notions of good teaching that might reside more closely with teachers' identities. All the change must come from the individual. The disruption of the pandemic thus offered a unique view into the tensions between individual commitments and institutional priorities, since the latter were forced to shift in the crisis.

1.4 Review of the Research on the Development of “Good Teaching”

Amidst an institutional environment that too often contributes to deprofessionalization and demoralization, teachers are expected to navigate competing (and even conflicting) messages about “good teaching.” Since images of good teaching are implicit in any professional learning project, whether pre-service teacher education or in-service professional development (PD), these conflicts matter for teacher learning. Imagine, for instance, that Kasey Zimmerman, the teacher quoted in the epigraph, attends a PD on formative assessment practices because he wants to encourage his students to use his feedback to build conceptual understanding. Instead, the PD offers a laundry list of “best practices,” like using red, yellow, and green cups for students to signal their current levels of understanding and multiple-choice exit tickets. Neither of these aligns with the substantive, responsive notion of formative assessment Kasey wanted to bring to his classroom (Black & Wiliam, 1998).

Kasey's disappointment could just seem like a workshop “miss.” However, on another level, deeply different notions of good teaching are at play here. Given accountability reform's emphasis on student outcomes (and near radio silence on particular teaching methods; see Horn, 2018), schools and districts not making adequate yearly progress in relation to accountability

policies desperately sought ways to meet performance targets. Research emphasizing student outcomes — that is, large-scale quantitative work that sought to tie particular teaching practices to increases in test scores — gave such “best practice” frames particular traction in the PD landscape.

Rooted in the process-product tradition, this research sets out to determine certain behaviors, skills, or styles that correlate to student achievement scores (Harris, 1998). As Wilson and colleagues (2005) describe, the focus of process-product research on effective teaching is to examine highly quantifiable aspects of teaching to characterize which teaching practices best produce student learning. Examples of research in this tradition include Porter and Brophy’s (1988) synthesis of research on good teaching that conceptualizes teachers as “semi-autonomous professionals” and claims that research into good teaching looks for principles that will increase their effectiveness. The popularity of Doug Lemov’s (2010) *Teach Like a Champion* is further evidence of the widespread appeal of “best practices” derived from standardized test scores. This approach to studying effective teaching has typically been taken up to identify a set of universal teaching skills or strategies that lead to student learning (Duarte, 2013).

1.4.1 Qualitative Tradition of Determining “Best Practices”

Moving away from this student outcomes focus, some qualitative studies focus on teachers’ beliefs and practices, offering a different lens. Researchers in this tradition try to uncover “best” or “better” teaching practices that are not necessarily tied to student achievement outcomes. This body of work is often studied interpretively, emphasizing teachers’ actions in the classroom as the unit of analysis. At the same time, interpretive analyses are limited, since they depend on each researcher’s (often implicit) definitions of good teaching (Wilson et al., 2005). In

its more sophisticated form, this research involves teacher reflection (e.g., Lampert, 2010) and teacher change literature that focuses on changing teacher behaviors (Richardson, 1990). These reflections have often been taken up in teacher education as models to emulate, sometimes without sufficient attention to teachers' purposes for doing their work (e.g., Ball & Forzani, 2009). However, although these teaching practices may be less harmful to students than other teaching practices, they do not represent all the nuances of what it means to be a good teacher.

Policies or teacher learning experiences that focus on changing teacher behaviors usually conflate *good teaching* with *best practices*, a move that ultimately feeds into binary and decontextualized notions of “good” and “bad” teaching (Horn & Garner, 2022; Philip et al., 2019). By focusing solely on changing teacher actions toward a set of practices that have been pre-determined by policymakers or administrators — importantly, not by teachers themselves — this model of teacher learning relies on top-down, centralized ideas of what good teaching may look like. For example, Weiss and colleagues (2003) found that there was little variation in teaching strategies among teachers within the same district teaching from the same curriculum, leaving little room for teacher agency in choosing the teaching practices that may work best for them or their students and contributing to deprofessionalization (Milner, 2013). This example points to a paradox of teacher learning: On one hand, it is important that teachers' judgments matter in what they are learning to do as they strive to improve their teaching. On the other hand, giving teachers unguided discretion about what they could do would undoubtedly lead to other systemic problems, such as biased teaching practices.

There is a small body of research on the *development* of good teaching rather than determining good teaching practices. Richardson (1990) claims that learning-to-teach literature studies the teacher as the unit of analysis, focusing on the individual teacher's “cognitions,

beliefs, and other mental processes.” For example, Wilson and colleagues’ (2005) interview study on the development of good mathematics teaching investigated mentor teachers’ views of good mathematics teaching and how it develops. Munter and Correnti (2017) provide an example that takes up both the work on best practices and learning-to-teach in their study of how changes in teachers’ instructional practices (behavior as the unit of analysis) relate to their instructional vision (teacher as the unit of analysis). Personal vision, institutional vision, and teaching practices all must give and take together to converge on good teaching. The gap in this literature is that each piece takes into account one or some of these things and does not pay attention to all three.

1.4.2 Connecting Good Teaching with Pedagogical Judgment

The research reviewed above emphasizes practice rather than moral or relational commitments, yet teachers’ commitments, in their essence, are rooted in such values and shape their learning and practice. I offer a different framework to conceptualize ongoing mathematics teacher learning that takes into account teacher practices, institutional logics, *and* teachers’ personal visions, which necessarily take into account their unique contexts (see Figure 1.1). This framework aligns with a *situative view of teacher learning*, which posits that as teachers encounter new ideas, they negotiate messages about what teaching is with other meaning systems, a process in which their context is fundamental to an analysis of their learning (Horn & Garner, 2022; Horn & Kane, 2019). Instead of a top-down, forced alignment through tight coupling, in this framework, teacher learning is more of a give-and-take. Teacher learning can be thought of, in no small part, as a change in conception of what it means to be a good teacher.

This change must take into account institutional visions as well as teachers' actions and personal visions with the goal of minimizing the distance between the three, resulting in *good teaching*.

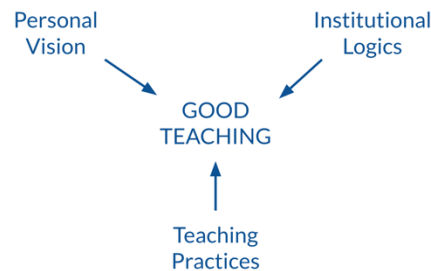


Figure 1.1: Triangulated Conception of Good Teaching

In this model, good teaching is a moving, perpetually partial target (Kumashiro, 2015) because, as personal visions change, contexts and actions also change (and ideally, institutions also change to take into account these conceptions). This framing is important to this study because the COVID-19 pandemic drastically affected institutional conditions and teaching practices. An understanding of good teaching that takes into account these effects allows for an analysis of teacher learning in the face of such changes.

This framework takes on a different perspective on the same ideas as Horn and Garner's (2022) pedagogical responsibility by shedding light on the possibility of less centralized institutional logics that makes way for the adaptive and contextual development of pedagogical judgment. Horn and Garner (2022) explore teacher learning as a conceptual change project through the development of pedagogical judgment, or the interplay between pedagogical action, pedagogical reasoning, and pedagogical responsibility. *Pedagogical action* refers to the "intentional and unintentional choices teachers make, both during and outside of classroom instruction (p. 99)." *Pedagogical reasoning* refers to the different interpretations and rationales teachers have for their pedagogical actions. Importantly, the same pedagogical actions may arise

for different reasons that speak to teachers' pedagogical responsibility (Horn & Garner, 2022). As discussed above, pedagogical responsibility attends to both teachers' ethical principles and institutional commitments.

Imagining institutional notions of good teaching responsive to changing circumstances and teacher contexts is crucial for the present study. Importantly, it requires a shift from conceptualizing K-12 mathematics education as an economic institution to conceptualizing it as a social institution, making way for looser coupling between teachers and the government and moving toward decentralization of mathematics education policies. This review of the literature has uncovered three important paradoxes of good teaching as it is currently treated as a technical problem. First, teachers may enter and remain in the classroom for its moral rewards and relational work, leading to tension with institutional logics. Yet, some teachers' commitments to good teaching may align with problematic institutional logics of student achievement. Second, the tightly coupled educational institution of today has serious consequences for teachers and teacher learning and, in its own paradoxical way, has amplified educational harm (Au, 2009; Horn, 2018). Yet, a return to the loosely coupled institution of the pre-NCLB era is not tenable because of the potential for unchecked harm to students from marginalized communities. Lastly, the current research shows that teachers' judgments matter in what they are learning to do as they strive to improve their teaching, but giving teachers unguided discretion about what they could do could lead to other systemic problems, such as biased teaching practices. To address these inherent paradoxes, we need a different way of thinking about good teaching embedded in problems faced by social institutions that moves beyond technical solutions; the current treatment of good teaching — and thus the contradictory learning environment it fosters — limits our analysis and proposed solutions that arise.

1.4.3 Good Teaching is a Wicked Problem

I align myself with Rittel and Webber (1973) by learning to see the process of good teaching as a culmination of links tying educational policy systems, research systems, and systems of classroom ecology together such that outputs from one become inputs to others. Rittel and Webber (1973) offer a conceptualization of social problems to help those in pursuit of solutions make sense of them: wicked problems. Originally used in social planning, the concept of *wicked problems* was taken up by design theorists Rittel and Webber as a response to society's hyper-focus on planning for efficiency resulting from the industrial age. They define a wicked problem as one that is difficult, impossible, and often undesirable to solve due to complex, incomplete, and changing conditions that, because of this, can never be fully understood.

I argue that the reason the concept of good teaching is so elusive is because it is a wicked problem, but that theorizing good teaching as a wicked problem opens previously unopened doors to supporting teachers in their pursuit of good teaching. I conceptualize *good teaching* as a social problem and map the problem of good teaching onto ten distinguishing properties of wicked problems outlined by Rittel and Webber (1973). In shifting from considering good teaching as an economic or institutional problem, "it becomes less apparent where problem centers lie and less apparent where and how we should intervene even if we do happen to know what aims we seek," (p. 159).

1.5 Discussion

In this chapter, I've argued that "good teaching" as it exists in current practice must take into account both institutional logics and teachers' commitments. In this study, I reframe good

teaching as a wicked problem to explore the ways that teachers balanced the needs of their students and accountability logics at a time when institutional demands were lifted. I investigate the ways teachers felt supported as they navigated tensions between competing messages of good teaching, moving away from a binary of “good” and “bad” teaching as the COVID-19 pandemic rendered one-size-fits-all solutions to the problem of good teaching as ineffective and irrelevant.

In the first section of this chapter, I described how accountability reform in U.S. education resulted in a tight coupling between teaching and policy, diminishing teacher autonomy. If good teaching were a straightforward, technical problem, tight coupling might be a reasonable solution. However, if good teaching is, in fact, a wicked problem, then we need other ways to examine what it is and how to support it. This framing exposes the flaws in tight coupling as a solution — flaws that were exacerbated during the COVID-19 pandemic. In some ways, the pandemic loosened the hold that state and federal policymakers had on teachers’ practice through the cancellation of standardized tests and the implementation of adaptive grading. Yet, in other ways, another new, unprecedented set of challenges arose for teachers as they navigated pandemic teaching. Understanding good teaching as a wicked problem allows for an investigation into this phenomenon while attending to the historical and cultural systems it is situated in.

1.5.1 Implications for Teacher Learning

A core characteristic of wicked problems is that the solutions are not “findable,” and yet, they rely on political judgment for resolution (Rittel & Webber, 1973). In pursuit of the development of a capitalistic workforce, U.S. policymakers developed a system intended to solve a “fixable” problem of good teaching by mandating student testing and teacher evaluation

systems. Pursuing questions of good teaching and its development as a wicked problem, however, shows the shortcomings of this techno-rational approach. The wicked problem framework suggests that we cannot come to a consensus on what good teaching is because each level of the institution has its own vision of a solution that cannot be tested or proven to work, all amidst incredibly high social and economic stakes. If we do not know what good teaching is – or cannot know – how can teachers be supported to become good teachers? By considering the problem of good teaching as a theoretical dilemma (a wicked problem) and not as a problem with a definitive solution, we can further explore the mechanisms through which teachers make sense of the problem of good teaching – such as developing personal visions and reconciling them with institutional visions and practices through the development of pedagogical judgment — perhaps even by changing the institution itself.

Drawing from Hammerness (2006), we can think of the wicked problem of good teaching as the problem of minimizing the distance between teachers’ practice and their personal *and* institutional visions. The loosening of the institutional coupling during the COVID-19 pandemic did, in some ways, narrow that distance. However, in other ways, teachers had to navigate a new landscape of good teaching as their personal visions were tested and they were forced to change their teaching practices. Because teachers are embedded in a system that assumes solutions to this problem, they have had to learn to independently bridge the gap between their personal vision and their current contexts, leading to feelings of either inspiration (if their contexts support their vision) or, more often, despair (Santoro, 2018). Investigating teaching during COVID-19 — a time when there were no known solutions — may help researchers and policymakers understand the possibilities for good teaching when it is treated as a wicked problem. Current professional development efforts and policy interventions work to align

teachers' pedagogical actions with institutional pedagogical responsibilities by focusing on a change in teachers' pedagogical actions to meet a fixed and static conception of the institution's pedagogical responsibility, thus hindering the development of teachers' pedagogical judgment (or teacher learning). Instead, recognizing teachers' pedagogical responsibilities as multidimensional – and often contradictory – moving targets creates room to work towards the alignment of teachers' pedagogical responsibilities and actions through pedagogical reasoning over time, contributing to teachers' moral satisfaction and success.

As I have shown, state and federal education policy does not concern itself at all with theories of teacher learning. Instead, current federal policies are hyper-focused on narrow visions of student learning, driving policy from the top down. There have been reform efforts that think about how students learn (e.g., the Coalition of Essential Schools [Sizer, 1986]), but theories of experienced teacher learning have not made their way from research to practice. There is a way to utilize the autonomy that policy gives the lower levels of the institution to start thinking about these theories of teacher learning and good teaching to be able to meet teachers where they are in their local contexts, fostering a learning environment where institutional logics better align with teachers' commitments to good teaching. The instructional crisis brought on by the COVID pandemic opened one such space to explore these issues.

CHAPTER 2

Methods: A Qualitative Analysis of Experienced Teacher Responsiveness During COVID-19

“I believe that we are the sum of all of our experiences, so how could this not change my teaching? It's not like we were out for a week, right? We will have been out for 12 weeks by the time this has finished. It's a long time, so I don't know how I could not be impacted.”

–Linda Simmons, high school geometry teacher, May 2020

In March 2020, school districts across the country suddenly moved all instruction online as the COVID-19 pandemic spiked. Teachers who had spent years honing their craft in the classroom were, as Linda Simmons states in the epigraph, forced to change their teaching. Little did we know at the time that some teachers would not return to their physical classrooms for an entire year, some even longer. As I argued in Chapter 1, the field of education is far from a position on what good mathematics teaching is in typical conditions. Yet from 2020 to 2021, teachers found themselves in a position where they were navigating and acting on new and changing visions of good teaching every day. Although this crisis was unwelcome, the resulting rupture of “normal” activity presents an opportunity to examine social processes, which are made more visible in times of disaster (Peek et al., 2021).

In this study, I aim to understand teachers’ experiences adapting their new visions of good teaching amidst a novel situation, viewing this adaptation as an instance of their learning. I will explore the institutional conditions that contribute to or hinder teachers’ adaptations and the ways teachers draw on and negotiate their pedagogical responsibility (Horn & Garner, 2022) in light of these conditions. To do so, I will draw on longitudinal interview data gathered from eight

experienced, secondary mathematics teachers teaching in the same large, urban region. All eight teachers are members of a highly selective professional development organization (PDO) that provides extra resources for their learning and requires additional time commitments from them, an indication of their strong dedication to their own and their students' learning. This study addresses the following research question: *How are well-resourced, experienced mathematics teachers in a large urban region transforming their teaching during the COVID-19 pandemic?*

Specifically, I explore three sub-research questions:

1. How did the focal teachers draw on and negotiate their pedagogical responsibilities during the initial phases of the COVID-19 pandemic?
2. What is the relationship between the focal teachers' visions of good teaching and their agency to recreate their practice (or not) as they organized themselves in the figured world of pandemic teaching?
3. After the initial crisis of online teaching, how did the focal teachers' experiences influence their instructional practice?

By looking at teachers' responsiveness during a highly uncertain, ongoing crisis, this dissertation illuminates the institutional conditions that contribute to or hinder teachers' learning, which I look at as the development of pedagogical judgment.

2.1 Theoretical Framework

2.1.1 Framing Pandemic Teaching through the Sociology of Disasters

I conceptualize the crisis of the global COVID-19 pandemic as a *disaster setting* and align myself with Peek and colleagues (2021), recognizing the importance of disaster settings as

“strategic site[s] for learning about social phenomena, examining social relationships and group-based patterns, and revealing social problems” (p. 222). Along with an understanding that teaching is a social practice, the sociology of disasters allows for the exploration of teaching at a time when the processes of ongoing teacher learning became hyper-visible (Peek et al., 2021). In other words, the COVID-19 pandemic as a disaster offered an opportunity to study teachers’ sensemaking and learning as they became more visible in such a setting.

To analyze this moment, I draw from Keller (2013) to consider the local human environments of those affected by the COVID-19 pandemic. In his conception of *place-based vulnerability* during a contemporary disaster, Keller draws from Bourdieu (1993) to argue:

Place is both physical and social: a site we can fix on a map but also one that denotes a precise social position. The overlapping of physical and social space offers a critical perspective on both the inegalitarian dimensions of disaster and its historical contingency (p. 301)

In this sense, a place-based analysis of disaster serves as a bridge between people and their physical and social contexts. A conceptualization of vulnerability to disaster as socially and historically produced highlights the role of human decision-making in people’s experiences, drawing attention to “critical ruptures” in social, economic, and educational institutions.

For example, emergency online teaching as a response to the COVID-19 pandemic resulted in a crucial moment when institutional logics were tested and, in some cases, institutional constraints were temporarily or permanently lifted. As a result, teachers found themselves needing to reorganize their work over time as they responded to an unprecedented teaching environment. However, an understanding of teachers’ experiences in this moment would be incomplete without an exploration into the physical, social, and institutional conditions

that may have contributed to their professional and personal vulnerability (or resiliency) to the global pandemic.

2.1.2 A Situative View of Teacher Learning to Understand Adaptations in Pandemic Teaching

A place-based analysis of teachers' experiences during the COVID-19 pandemic aligns with my *situative view of teacher learning* (Horn & Kane, 2019) described in Chapter 1. This view of teacher learning posits that as teachers encounter new ideas, they negotiate messages about what teaching is with other meaning systems, a process in which their context is fundamental to an analysis of their learning (Horn & Garner, 2022). However, as I argued in Chapter 1, the current research on teacher learning, with its emphasis on the mastery of ideal types of practice (e.g., Ball & Forzani, 2009; Core Practices Consortium, n.d.), tends to focus on individual learning (Goldsmith et al., 2014). This emphasis does not adequately situate teachers in their institutional and historical contexts (Philip et al., 2019), nor does it sufficiently capture the profound need for teachers to improvise and respond (Philip, 2019). For this reason, a situative theory of teacher learning helps capture the innovation and learning we witnessed as teachers navigated complex contexts in the wake of the crises posed by pandemic teaching.

These shifts revealed transformative teacher learning. A situative view offers a rich theory of teacher learning that can inform the development of responsive teaching more generally, since classrooms, even in “normal” times, necessarily require adaptations for particular students and contexts (Berman & McLaughlin, 1976; Kennedy, 2005).

In sum, the COVID-19 pandemic resulted in a unique teaching context in which the previous institutional logics were interrupted, allowing for the potential for more teacher autonomy. In this study, I analyze teachers' learning of and sensemaking around ambitious and

equitable mathematics instruction during this moment from a situative perspective that takes into account learners' contexts. Specifically, I explore the idea of the different meanings of “good teaching” through the lens of institutional logics, teaching practices, and teachers’ personal visions.

2.2 Methods

This study examines teaching and learning in the context of the COVID-19 pandemic and, as such, may be classified as representing an *extreme case*. Flyvbjerg (2006) claims that the purpose of extreme cases is to “obtain information on unusual cases, which can be especially problematic or especially good in a more closely defined sense” (p. 230). I conceptualize this case as extreme in two ways. First, the context of COVID-19 as a disaster setting provides insight into how institutional logics shapes teaching since the crisis rendered them hyper-visible. Second, the specific place and participants — the PDO teachers — are unusual cases because of the external support and notable resiliency they showed, especially compared to other teachers in the U.S., resulting in an *especially good* research context for studying responsive mathematics teaching and learning in a disaster setting. While the participants are atypical in important ways, their creativity in response to the pandemic illustrates what is possible in this difficult circumstance.

2.2.1 Research Context

In mid-March 2020, the first documented COVID-19 cases appeared in the United States, including Los Angeles, California, where this study takes place. Several days later, district leaders across the region emailed teachers that schools would close for two weeks, initially with

no mandated online learning. During these two weeks, the closure was extended through the end of the 2019-2020 school year, and continued online learning was mandated. By July 2020, teachers were notified that the 2020-2021 academic year would remain virtual indefinitely. Teachers taught fully online until April 2021, when some schools moved toward what the districts referred to as a “hybrid”¹ model, where a portion of the students attended online classes in school buildings. The focal participants’ schools did not return to full-time in-person teaching until the 2021-2022 school year (for a complete timeline of events, see Figure 2.1).

2.2.1.1 Linking Place and Vulnerability During the COVID-19 Pandemic

To further explain the ‘unusual-ness’ of this case study, I will first describe the local setting in which this study takes place. In doing so, I align myself with Keller (2013) by attending to the place-based consequences of the COVID-19 pandemic:

An ethnographically informed history of a contemporary disaster must account for the sites in which that disaster ‘took place’ and engage with those sites as critical sources that allow us to map this intersection of social and physical spaces of vulnerability. (p. 302)

This study participants work at eight schools across three public school districts in the Los Angeles, California region, a school context that is considered *urban intensive* due to its size and density (Milner, 2012). In particular, I focus on teachers at eight different middle and high schools across the region (see Table 2.1). The students in these eight schools are members of a population that emerged as particularly vulnerable as the pandemic progressed. For example, Latinx students make up the largest group of students in the schools — a statistic reflected not only in the participants’ eight schools but also in the demographics of Los Angeles as a whole.

¹ I use the word “hybrid” to represent the districts’ description of the shift from fully remote teaching to a different model. However, the work of Bartlett (2022) highlights the ambiguity of the term *hybrid* when describing pandemic-modified schooling configurations and calls for the need to discern among hybrid models more closely when analyzing schools’ responses to the pandemic.

The Latinx community in Los Angeles was impacted particularly hard by the pandemic because they often live in multigenerational households, work jobs that do not allow working from home, and have limited access to information because of local newspaper and church closures (Caldwell, 2020; NPR, 2020; Zarefsky, 2020).

Participant Name	Middle/High	School Size	% ELL	% FRPL	Student Demographics
Amber Singleton	Edgerton High School	4750	0%	50%	40% Latinx, 25% White, 20% Asian/Asian American, 10% Filipinx, 5% African/African American
Brad Miller	Noether High School	1750	10%	75%	60% Latinx, 15% African/African American, 15% Asian/Asian American, 10% White, 5% Filipinx
Ezio Martín	Rees Middle School	750	15%	80%	80% Latinx, 5% Asian, 5% White, 5% Filipinx, 5% African/African American
Jasmine Lin	Nunes High School	2250	20%	50%	70% Asian/Asian American, 20% Latinx, 20% 2+ races, >0% Filipinx, >0% White
Jason Schulte	Stephens High School (6-12)	1000	10%	95%	100% Latinx
Kasey Zimmerman	Vaughan School	750	0%	15%	40% Latinx, 25% White, 10% Asian/Asian American, 10% 2+ races, 5% African/African American, >0% Filipinx
Kirsten Nagi	Petters High School	1500	5%	85%	70% Latinx, 10% African/African American, 10% White, 5% Asian/Asian American, 5% Filipinx
Linda Simmons	Fern Hunt High School	1500	20%	85%	70% Latinx, 15% White, 5% Asian, 5% African/African American, >0% Filipinx

Note. This list of teachers includes their school level, approximate school size, and student demographic information. In adherence to the district’s IRB contingencies, all proper names are pseudonyms. School size has been rounded to the nearest multiple of 25 and demographic data has been rounded to the nearest multiple of 5 to prevent reverse lookup of sites.

Table 2.1: Participating Teachers’ School Demographics

In addition to the virus, members of the community also felt the impact of state violence on Black people highlighted by the death of George Floyd in May 2020. In August 2020, Linda brought to light the importance of students’ geographic and social histories as they experience the multiple pandemics (Mitchell, 2022) of COVID-19 and systemic racism simultaneously:

When the sort of reaction after George Floyd was murdered happened, and I'm watching videos of kids storming into shops downtown and an awful lot of my Black students live in that area. All I was thinking was, "Oh, please don't. Please don't. Please don't get swept up in this. Yes, you have every right to be angry. Yes, you have every right to be out there saying 'Enough is enough. It's too much. It's far too much.' But, please don't." Because I already had a kid who right at the beginning was ghosting me and then said, "Sorry I haven't been here. I was incarcerated." (*Interview 2, August 2020*)

What's more, most of the schools in this study served Asian American students (in fact, Nunes High School's student population is a majority Asian/Asian American) – a community that was also affected by a rise in violence and discrimination in the onset of the pandemic in 2020 (Pillai et al., 2021). As Kristen described:

Because I sponsor the Asian Student Club, [students] have been sharing their concerns about going back to school. That's a very scary thing to think that they have those concerns. I'm realizing, and I even told them, that this would be a project that we should work on, as a club, and that I should try to share with all the staff that we need to find out how students– if they're feeling safe if they're going to go back on campus. In particular, for Asian American students, they probably feel very unsafe and we need to hear their concerns. (*Interview 4, March 2021*)

In addition to race-based vulnerabilities that surfaced in Los Angeles, the COVID-19 pandemic exacerbated socioeconomic inequities among the U.S. population (Los Angeles Times, 2020). Importantly to this study, the quality of education was also found to differ during this time, with high-poverty districts offering less time on schoolwork and more independent busy work than wealthier districts (Belsha, 2020). Indeed, in seven of the eight schools in this study,

50% or more students receive free or reduced-price lunch, a metric that is often used as a proxy for the student body's socioeconomic status. As Linda reflected on her role as a teacher in her school community, she said:

Just knowing the population we work with, what I said was, "Okay, I can't in good conscience give them anything that I have to have them learn." Because when they come back, if it was really necessary, I'm going to feel compelled to reteach it in person, for the kids that didn't have the opportunity, right? (*Interview 1, May 2020*)

In these ways, the pandemic drew attention to several "critical ruptures" (Keller, 2013) in the foundation of the U.S. — and Los Angeles — as society left the public school districts' populations exceptionally vulnerable, demonstrating the critical importance of investigating local education stakeholders' responses to such disproportionate vulnerability.

Additionally, these characteristics contribute to the "urbaness" of this study's local context. According to Welsh and Swain (2020), one tenet of urban education is that it is "defined as a continuum of conditions dependent on the characteristics, challenges, and context" (p. 97). Specifically, the public school districts in the Los Angeles area enroll a higher concentration of low-income, minoritized, and multi-lingual students relative to other U.S. rural and suburban districts, and the districts are characterized by a history of mass immigration for economic and social reasons (Welsh & Swain, 2020). Indeed, Los Angeles is described by Milner (2012) as an *urban intensive* school context because of the large number of people in the city and consequently the schools, pointing toward the ways the broader environment and outside of school factors are directly connected to what happens inside of the schools. However, I heed Welsh and Swain's caution to avoid collapsing people, place, and space into a static and

monolithic conception of urban education and recognize that such a conception has historically embodied deficit perspectives. Instead, I aim to situate this study in its geographic and social context in a way that contributes to the dynamic, complex, and socially constructed nature of urban education (Welsh & Swain, 2020).

2.2.1.2 Institutional Conditions that Contribute to Place-Based Resiliency

An important characteristic of U.S. education during the COVID-19 pandemic was its splintered response, resulting in vastly different working conditions for teachers across the country (Bartlett et al., 2021). This study takes place in institutional environments where teachers felt supported, making it an ideal context to study the ways they adapted their instruction. Extending Keller's (2013) conception of place-based vulnerability, this study is a case of *place-based resiliency*: the social geography of the teachers serves as a critical source to examine the conditions under which they felt supported and (relatively) successful.

The teachers in this study did not experience some of the same uncertainties as others across the country (Bartlett et al., 2021), such as having access to vaccines to go back to school in person or not having adequate professional development to learn new technologies (Cornish, 2021). The specific sources of uncertainty that remained – like how to be a good online math teacher – presented opportunities to study teacher learning as it became hyper-visible in a disaster setting (Peek et al., 2021). For example, Linda explained “the fact that [reopening] hasn't been a part of the narrative— it hasn't been a huge piece of the conversation— has made everybody else feel better and feel like they could focus more” (*Interview 4, March 2021*). Because district leadership has been prioritizing teacher and student safety throughout the entire pandemic, Linda and the other teachers had a longer time horizon for their planning. Unlike

teachers in other places, they were not left wondering where they would be teaching next week.

When describing the role his superintendent took, another participant, Brad, said:

I think he's done a really solid job. I haven't been stressed at all in terms of thinking we're going back. It just doesn't seem like it's safe. I believe in him that he won't allow us to go back until it's safe. (*Interview 4, March 2021*)

Echoing Linda's gratitude for clear messaging, Brad's reported experience contrasts with teachers elsewhere in the country who reported being worried about risks to their health during premature returns to classroom instruction (Kamenetz & Isensee, 2020). As these teachers describe, this supportive local context freed up emotional stress and physical time for teachers in this study to focus on transforming their math teaching, making it an ideal site for this inquiry.

Furthermore, the educational environment in this study is characterized by strong teacher unions. One teacher, Amber, is the union representative of her school. She described the union's involvement in the pandemic response:

We were negotiating with our administration on working conditions for the upcoming year. And we met once to twice a week for three hours for the majority of the summer. I think we ended the first week of August and we started in June... It was really interesting to be in discussions and genuine arguments with them about various simple things that we were trying to tell them about what the experience was like... I think we didn't get everything that we asked for, but we never will. I think we ended in a place that was doable for what we were about to start. (*Interview 2, August 2020*)

In this excerpt, Amber describes the extensive time the union spent negotiating over the summer for continued online instruction in the 2020-2021 school year. Because of the strength of the union, negotiations were settled in a “doable” place for teachers and the district.

Another important characteristic of this study is the participants’ experiences transitioning to what the districts referred to as “hybrid” teaching. Teachers in this study returned to their physical classrooms in the Spring of 2021, yet they continued to teach fully online; the students that were in their classrooms with them attended virtual school in the same way they had when they were at home. Importantly, this variation of hybrid teaching ensured that teachers did not have to adjust their practice to meet the demands of a new teaching model; they could continue planning and implementing virtual lessons in the exact way they had been for all of online teaching. This specific model of hybrid teaching is markedly different from what other districts implemented, which typically required teachers to learn yet another new version of school as they juggled different lessons for in-person and remote students simultaneously (Bartlett, 2022). The hybrid conditions the teachers in this study experienced allowed for the time and space for teacher learning in a virtual environment.

The teachers in this study were immersed in professional conditions that fostered their resiliency in a time of crisis. They were supported and protected by their district leadership, they had access to professional development tailored to their contexts, and they were members of strong teacher unions that served their best interests. In these ways, this study represents a uniquely favorable setting to examine secondary mathematics teachers’ responsive instructional practice.

2.2.3 Participants

This study extends a four-year ethnographic study of secondary mathematics teacher learning, conducted in partnership with the PDO, which has an explicit commitment to ambitious and equitable mathematics teaching. We² identified the participants for this study through a combination of theoretical sampling and convenience sampling (Gerson & Damaske, 2020). In May 2020, teachers from the PDO were given the option to volunteer to participate in a pilot interview for the study. Of the 80 teachers in the PDO, 11 teachers were selected based on their interest in reflecting on their experiences pivoting to distance learning. All teachers in this pilot interview were offered the option to remain in the study for the duration of the 2020-2021 school year. Of the 11 teachers, 8 elected to continue to participate (see Table 2.1). Teachers were compensated for their participation in the pilot interview and received continued financial compensation for their participation for the duration of the study.

As described above, I conceptualize this participant selection as unusually strong in that its participants are uniquely positioned to find success amidst a global crisis. In addition to the favorable conditions that make this an informative extreme case, the participants themselves were well-positioned to make use of those conditions. First, the eight teachers in this study are all experienced teachers with 15 years or more of teaching experience, many of whom are seen as leaders in their schools or departments (see Table 2.2). Professionally, these teachers are considered “good teachers” in their schools and often talk about relying on their extensive experiences when adapting their teaching. Additionally, one characteristic of the U.S.’s response to COVID-19 was the domino effect of the widespread lack of childcare. Teachers with their

² The research team for this study consisted of myself, Ilana Horn (Principal Investigator), and four research assistants: Elizabeth Metts, Claire McQuillen, Jessica Moses, and Katy Janik. Participant selection and protocol design were done collaboratively by myself and Ilana Horn; all interviews were conducted by myself with the exception of two member-check interviews, which were conducted by Elizabeth Metts; and in-process analysis was a collaborative process with all five members of the team.

own children reported being “beyond tired and stressed” more than teachers with no childcare responsibilities (Will, 2020). In my sample, no teacher identified as the primary caregiver to children, which was likely an important condition for participants’ professional resiliency during the pandemic.

Participant Name	Gender Identification	Race Identification	Leadership Role	Math Courses Taught During Study
Amber Singleton	Female	White	Union Representative	AP Computer Science, Geometry, Pre-Calculus, Algebra I, Algebra I Support
Brad Miller	Male	White	Department Head	AP Statistics, Geometry, Algebra I, Algebra 2, Integrated Math 3
Ezio Martín	Male	White	Department Head	8th Grade Math
Jasmine Lin	Female	Asian American		Intensified Integrated Math 1, Integrated Math 3, AP Computer Science
Jason Schulte	Male	White	Athletic Director	AP Computer Science, Integrated Math 1, Integrated Math 2, Advanced Algebra with Finance
Kasey Zimmerman	Male	White		Integrated Math 1, Integrated Math 3, Integrated Math 4, Math Modeling
Kirsten Nagi	Female	Asian American		Algebra 1, Algebra 2, Pre-Calculus, Intro Computer Science, Transition to College Math & Statistics
Linda Simmons	Female	White	Department Head	Geometry

Table 2.2: Participating Teachers

Second, these teachers have a strong, supportive community through the PDO. The approximately 80 PDO teachers were selected for renewable fellowships, met monthly during the school year for professional development, and attended conferences together. According to an external evaluator’s report, PDO teachers typically experienced higher satisfaction with professional learning, greater retention, and stronger student survey and test results than a

matched control group. PDO teachers are passionate about and committed to their work, collaborate regularly, and reflect on their instruction.

Lastly, the teachers in this sample taught a wide variety of courses throughout the study, providing nuance into their experiences with adapting lesson plans, assessments, and teaching practices to students with a variety of mathematical backgrounds.

Because this is an extreme case, the goal of this study is not generalizability or representativeness, but rather to provide deeper insights into the experiences and perceptions of a specific group of teachers who found ways to be responsive in their instruction during a challenging educational crisis (Gerson & Damaske, 2020). By conceptualizing this sample as unusually good, the findings from this study can be extended to identify the contextual circumstances that foster resilience among teachers, informing the field about what it might mean to create conditions for resilience for more educators.

2.2.4 Study Design: A Sociocultural Approach to Interviewing

This study seeks to explore how well-resourced, experienced secondary mathematics teachers in a large urban region transformed their teaching during the COVID-19 pandemic. To accomplish this, I approach this study from an epistemological understanding of teaching and learning that (1) teachers' lived experiences are valid sources of knowledge (Marshall & Rossman, 2011) and (2) teachers' ongoing learning involves making sense of their own experiences embedded in their unique contexts over time (Connelly & Clandinin, 1990; Horn & Kane, 2019). As such, a qualitative, sociocultural approach to this study is appropriate to center teachers' realities without separating the knower from the known (Charmaz & Belgrave, 2012; Lincoln & Guba, 1985). In other words, we designed this study based on the fundamental

premise that teachers' understandings and enactment of good teaching are intricately embedded in their own narration of their experiences. I see my role as a researcher as one of "strategically assembl[ing]" meaning alongside my participants as we co-constructed their narratives of my research questions (Gubrium & Holstein, 2012, p. 33).

In alignment with the above epistemological commitments, this ethnomethodological study was designed with two goals in mind: (1) to help teachers understand their experiences in the context of pandemic teaching and (2) to tell the stories of the participants over time as a way to document and examine their adaptations in their practice. To accomplish these goals, this qualitative study primarily utilizes semi-structured lifeworld interviews that captured participants' narratives as they navigated pandemic teaching (Brinkmann & Kvale, 2015). Semi-structured interviews allowed me to design for consistency across teachers in any given interview event as well as over time with each teacher. At the same time, they make room for the timing and order of questions in each interview to be fluid and conversational, as well as allow me to individually tailor each subsequent interview to each teacher's unique experiences (Brinkmann & Kvale, 2015; Corbin & Strauss, 1990). These core characteristics of semi-structured interviews provide structure to tightly connect interviews such that the threads of teachers' experiences and understandings can be adequately developed over time. They also allow the freedom to incorporate artifacts to elicit consistent, new, or different understandings of teachers' experiences as they unfolded (Morse, 2012).

Teachers navigate institutional, ethical, and professional commitments when realizing their pedagogical responsibilities (Horn & Garner, 2022). Thus, to address research question 1, we designed this study through a lens of institutional change by incorporating artifacts of local, state, and national policy changes to the pandemic in interview design and data analysis.

Research question 2 stems from an understanding of “good teaching” as situatively developed over time (Chen et al., 2018), aligning with this study’s ethnographic approach. Specifically, we use an evolving process of longitudinal semi-structured lifeworld interviews to capture teachers’ own narratives of their pedagogical responsibilities and visions of good teaching. Lastly, research question 3 explores the concept of *adaptive teaching practices* to better understand teacher change. To address this question, this study incorporated member check interviews during the 2022-2023 academic year, when teachers were back in their classrooms teaching in person.

2.2.4.1 Researcher Positionality

Of course, qualitative research is always an interaction between researcher and participants. In this light, understanding who I was in the context of this study is a critical part of my analysis. Drawing on Milner (2007), I consider my “self, self in relation to others, engage in reflection and representation, and shift from self to system” (p. 395). I am a young, white woman educator, and as such, I come from the most common racial and gender identity of U.S. educators (Ingersoll et al., 2021). While I grew up in primarily suburban and rural communities, my teaching career has been solely in urban public schools in the Northeast. At the time of the study, I had been a research assistant on a project based in Los Angeles for two years, attending professional development sessions and participating in coaching debriefs with many of the teachers that would come to be this study’s participants.

In many ways, because of its familiarity, my identity was non-threatening to the teachers I interviewed. White women teachers are so common in public school spaces that we almost become unmarked. Additionally, I am nearly the same age as most participants and, like all participants, had no primary childcare responsibilities throughout the peak of the pandemic. My

physical presence in Los Angeles as a research assistant prior to pandemic lockdown granted me a level of trust before interviews even began. As a result, I was often positioned as a familiar colleague during interviews; I was an insider in their world of teaching, presenting an opportunity for the teachers in this study to engage in the type of teacher lunchroom chatter that got taken away from them as their entire jobs moved online from their homes.

Despite these affordances of my background and identity, one crucial difference emerged in interviews: I did not have any experience teaching online during a global pandemic. As a result, I was authentically learning alongside my participants about what it meant to teach in such a crisis. The familiarity and strangeness were thus both authentic, and I sought out a generative balance between insider and outsider in my interactions with the participants, trying to be mindful of not making assumptions. Importantly, given the novelty of the context, the teachers in this study were also navigating what expertise meant in this space, mitigating a lot of potential power dynamics. I built in questions, probes, and time in interviews to reflect on the moment and its effect on all of us. In these ways, while the researcher/participant power imbalance is always present, the playing field was uniquely leveled and I became an instrument in the data collection, opening opportunities for a rich data set that captured teachers' candid experiences as they grew and adapted over time.

One important characteristic of this study was that the pandemic laminated contexts (Ochs et al., 1994), creating a shared experience of what it meant to live and interact, particularly during the initial lockdown period. The data for this study were collected via Zoom, introducing a duality of the interview space. On one hand, each teacher and I entered each interview on even ground because we were both situated in our homes, in an environment we felt comfortable and safe. On the other hand, the teachers' Zoom space was also their classroom space at this time,

opening opportunities for the teachers to invite me into their teaching worlds when they wanted. Indeed, teachers often seamlessly transitioned between Zoom as a site for interviewing and Zoom as a glimpse into their classrooms. This duality of virtual interview space added to my understanding of participants' teaching contexts while contributing to their comfort with me as they shared their experiences.

2.2.4.2 Reflexive Longitudinal Lifeworld Interviews

To investigate teachers' transformations during the COVID-19 pandemic, we designed an interview method we refer to as *reflexive longitudinal lifeworld interviewing*. The study of such a disaster setting (Peek et al., 2021) called for a novel design to capture both the historical moment and the participants' unfolding experiences. We recognized that both the moment and experiences were changing over time in ways that neither the researcher nor the participants could know or anticipate. Reflexive longitudinal lifeworld interviewing (RLLI) was developed to document such changes, allowing for flexibility to capture shifts in teachers' contexts and narratives of their experiences throughout the data collection process.

In our conception of RLLI, researchers develop interview protocols akin to those of lifeworld interviewing (Brinkmann & Kvale, 2015). This approach shares similarities with typical lifeworld interviews, which seek to access participants' experiences of their everyday worlds. However, it differs in that the lifeworld itself keeps changing in unexpected ways. For this reason, we responded methodologically to the pandemic context, which presented unique circumstances that required ongoing sensemaking. For this reason, our sensemaking as researchers evolved alongside our participants, as different phases as the pandemic unfolded, resulting in a need for us as researchers to engage in substantive in-process data analysis (Emerson et al., 2011), looking at both interview responses and content analysis of relevant

current events after each interview. The findings of these ongoing analyses were then used in the development of the subsequent interview protocol. As Figure 2.1 shows, this interview design is necessarily *longitudinal* to capture the change in both its setting and its participants' experiences over time.

Importantly, RLLIs are dependent on the researchers' interpretations of environmental impacts and participants' experiences gleaned during in-process analysis. Later interview protocols of the same study could look different, depending on the analysis and interpretation of the data, as well as the design of each subsequent interview protocol at earlier stages. Thus, this design is *reflexive* insofar as it centers participants' own words and experiences and invites the researcher to attend to their position in the world in relation to those involved in the study (Call-Cummings & Ross, 2019); it is an act of co-interpretation of unfolding experiences. An important characteristic of RLLIs is their unpredictability; the researcher designs each interview protocol as a response to environmental and experiential changes as they emerge in real-time such that later protocols cannot be developed at the onset of the study.

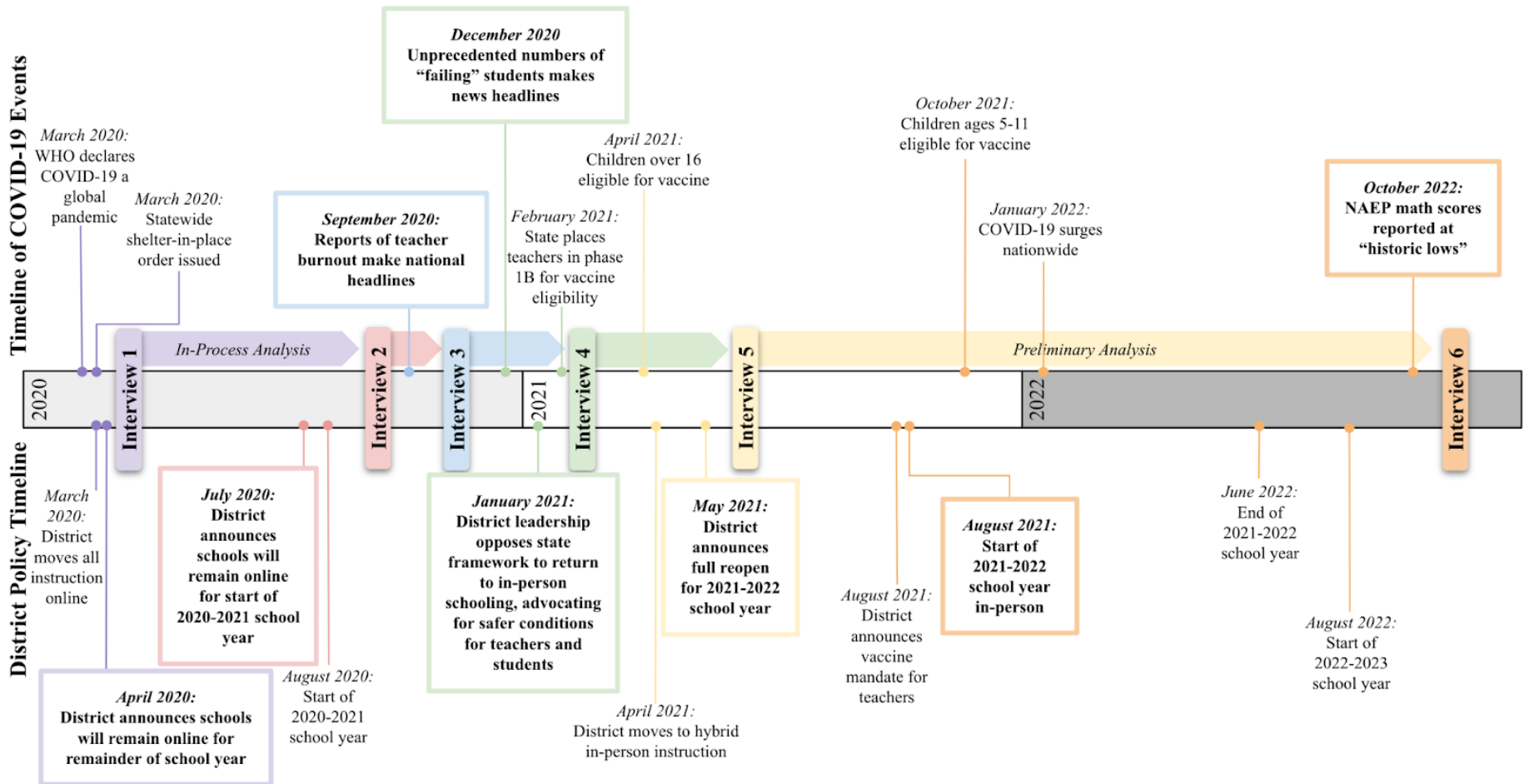


Figure 2.1: Timeline of Data Collection

To illustrate the RLLI methodology, I will discuss how it was used in this study. In the timeline shown in Figure 2.1, I show the relationship between *events* and *interviews* by highlighting them with the same color. For example, we first developed an initial semi-structured interview protocol (Interview 1, shown in purple) that investigated teachers' experiences pivoting to emergency online instruction (the district policy announced in March of 2020, outlined in purple). After this initial interview, I engaged in a preliminary analysis of the interview data and coded for themes across participants. These themes included time management, centering student thinking, and building and maintaining meaningful relationships. I also gathered data from local school district memos and popular narratives of learning and teaching in the media. The semi-structured protocol for Interview 2 (highlighted in red in Figure 2.1) was developed to address both the themes that emerged from Interview 1 and the news that the district would be starting the 2020-2021 school year remotely (outlined in red in Figure 2.1).

After I conducted Interview 2, I performed a preliminary analysis of Interview 1 and Interview 2 data, coding for themes across and within participants. Thus, the second analysis allowed for more targeted interview questions in Interview 3 (highlighted in blue in Figure 2.1) that responded to (1) the themes identified in the responses of individual teachers over time, (2) the common themes identified among all teachers, and (3) relevant national narratives or district policies that had emerged since Interview 2 (outlined in blue in Figure 2.1). Each subsequent interview protocol was grounded in the language of the study's participants in such a way that each interview served as both a lifeworld interview and a member check interview (Emerson et al., 2011). Thus, RLLI captures both environmental and experiential changes over time and helps qualitative researchers document participants' emerging understandings of unprecedented situations.

2.2.5 Data Sources

To investigate how well-resourced, experienced mathematics teachers in a large urban region transformed their teaching during the COVID-19 pandemic, I needed to gather data that centered teachers' own narratives of their experiences. To that end, data for this study currently includes 5 interview transcripts from all 8 participating teachers, fieldnotes from participant observations of 3 of the 8 teachers' department meetings, content analysis of relevant announcements from the district and national media coverage of education during COVID-19 (Altheide & Schneider, 2012), and member-check interview transcripts from 7 of the 8 participating teachers. In this semi-structured interview study, I conducted iterative cycles of data collection and analysis, starting with Interview 1 in May 2020 (Emerson et al., 2011). In between interviews, I analyzed data from previous interviews, content analyses, and participant observations to inform subsequent interview protocols. Each interview was conducted via Zoom, a video conferencing technology, and lasted between 45 minutes to 120 minutes. Every interview was recorded and transcribed.

2.2.6 Study Timeline

Date	Data	Artifact	Goals	RQs
May 2020	Interview 1: Pilot		Capture teachers' initial reactions to teaching in a crisis	1, 2, 3
August 2020	Interview 2		1. Revisit dilemmas uncovered in Interview 1 2. Understand how teachers are preparing for a new academic year of online teaching	1, 2, 3

Date	Data	Artifact	Goals	RQs
October 2020	Interview 3	Teacher Lesson Plan	<ol style="list-style-type: none"> 1. Prompt teachers to reflect on common themes identified from interviews 1 & 2 2. Explore teachers' current individual concerns 3. Understand what lesson planning and teaching looks like 	1, 2
March 2021	Interview 4	Summary Table Teacher Assessment	<ol style="list-style-type: none"> 1. Elicit teachers' opinions on local and national narratives on teaching 2. Member check interpretations of prior interview responses 3. Explore teachers' development of adaptive expertise 	1, 2
June 2021	Interview 5		<ol style="list-style-type: none"> 1. Member check my understandings of teachers' experiences 2. Elicit teachers' reflections of the '20-'21 academic year 	1, 2, 3
November 2022	Interview 6		<ol style="list-style-type: none"> 1. Elicit teachers' experiences transitioning back to full time in-person teaching 2. Member check interpretations of prior interview responses 	3

Note. For full interview protocols, see Appendix.

Table 2.3: Summary of Interviews

2.2.6.1 Interview 1: Pilot Interview

I conducted Interview 1, the pilot interview, with 11 PDO teachers in May 2020. The goal of Interview 1 was to capture teachers' experiences teaching in a crisis. Specifically, I developed a semi-structured interview protocol that responded to the recent announcement that the school district would remain online for the remainder of the school year. After the interviews were completed and transcribed, I used open coding to identify themes across interviews (Charmaz, 2008). It became clear that teachers were largely contending with new, but similar, dilemmas in their move to online teaching. For example, as was the case before the pandemic, teachers faced dilemmas about how to best use their time and energy as they planned and

reworked lessons. However, the tradeoff calculus shifted in important ways as they needed to contend with the new online environment. As Linda described:

I'm spending a crapload of time looking for conceptual explanation, because I have the sense that there is so much video out there. [...] I'm starting to get the notion that it would be faster to build it from scratch than to find the needle in the haystack, because so much of it is just answer-getting. (*Interview 1, May 2020*)

In addition to time management, many teachers also reported struggling with centering student thinking: Of the 11 teachers that discussed centering student thinking, five mentioned that they felt that their lessons involved “more lecture.” Additionally, they grappled with building and maintaining meaningful relationships. For instance, in Interview 1, Ezio said, “I feel like the relationship with the students has diminished a lot,” a sentiment echoed by other teachers as well.

2.2.6.2 Interview 2

Eight of the 11 teachers that participated in Interview 1 elected to stay in the study once we secured funding for the longitudinal investigation (see Table 2.1). I interviewed these eight teachers a second time in August 2020. Interview 2 used a protocol informed by the data gathered from Interview 1, including questions about the dilemmas the teachers discussed in the first interview, such as time management, centering student thinking, and building and maintaining meaningful relationships, as well as how they were preparing for a new year of online teaching. Consistent with the objectives of RLLI, the Interview 2 protocol also included questions eliciting teachers' reactions to a recent district announcement that the 2020-2021 school year would begin remotely for all students and faculty. Once these interviews were complete, I went through another round of open coding of the Interview 2 transcripts. I built on

themes from Interview 1 as well as identified new themes across all 8 teachers. I also engaged in open coding to identify themes within individual teacher data that emerged from the two rounds of interviews (Charmaz, 2008). From these data, I constructed a third interview protocol.

2.2.6.3 Interview 3

Interview 3, conducted in October 2020, consisted of two parts. Part one contained questions that were identical across the teachers that addressed across-case themes like strategically selecting content, saturation with online resources, and attendance. In this part, I responded to recent narratives in the media reporting widespread teacher burnout by including questions to elicit teachers' overall workload and the impact that several months of online pandemic teaching may have had on their wellbeing. The second part of the interview included questions that were unique to each teacher as informed by the first two interviews. The goal for this second, more personalized section was to circle back to teachers' concerns. This section typically included specific quotes to jog participants' memories, such as, in Amber's Interview 3 protocol, I said, "You talked about wanting to replicate the spirit of 'chatty Wednesdays' by thinking of creative ways for students to get to know each other. Have you been able to do this?". In Interview 3, I also asked that teachers share a lesson plan with me as an artifact to get a clearer sense of what lesson planning and teaching looked like for them. The protocol consisted of six questions designed to understand each teacher's lesson planning process as they walked me through their lesson artifact (all protocols are included in the Appendix). Interview 3 is a complex illustration of RLLI: it captures changes in teachers' experiences informed by Interview 2 themes, changes in their environment informed by news reports, and member-checked individual teachers' prior responses in a more personalized section.

2.2.6.4 Interview 4

Interview 4 was conducted in March 2021, and I developed its protocol with three goals in mind: (1) to elicit teachers' opinions on local and national narratives on teaching; (2) to member check interpretations of prior interview responses (Emerson et al., 2011); and (3) to continue to explore teachers' situational adjustments through more targeted questions. These goals are consistent with the objectives of RLLI. To accomplish the first goal, I cited information gathered through content analyses of local school district memos and transcripts of superintendent announcements as well as national news stories and popular narratives of learning and teaching during the pandemic and asked the participating teachers' thoughts. For example, content analysis of Thompson's (2020) ABC News article revealed that educators attribute a staggering increase in failing grades to poor attendance, unreliable internet access, and fewer opportunities for teachers to check in on individual students. This data informed the interview question *What percentage of students do you have failing your classes and is this typical?*

To accomplish the second goal of member checking, I identified themes that came up in all three previous interviews across teachers, such as *time allocation*, *attendance*, and *supporting student exploration*. For each theme, I summarized each teacher's most recent discussion in a table. During the interview, I shared the summary table with each teacher and asked them whether they agreed, disagreed, or if something had changed.

Lastly, to continue to explore teachers' situational adjustments, I incorporated targeted questions such as *What do you think you've gotten good at as a result of teaching remotely?* and, *Have your ideas about what being a good teacher looks like had to change this year? In what ways?*

2.2.6.5 Interview 5

Interview 5 took place in June 2021. This interview was designed to encourage teachers to reflect on the lasting impact teaching fully online during nearly a full school year will have on their teaching. The interview was divided into three main parts: reflection on the past year, reflection on next year, and reflection on the long-term impacts. Consistent with the goals of RLLIs, the questions eliciting teachers' reflections on the past year were constructed using teachers' own narratives of their experiences from Interviews 1, 2, 3, and 4. Questions eliciting teachers' reflections on the next year were informed by a recent district announcement that the 2021-2022 school year would be fully in-person for the first time since early March 2020. Thus, the study continued to respond to environmental and experiential changes as they unfolded in real time even in its final interview protocol.

2.2.6.6 Interview 6

I conducted Interview 6 with seven of the eight participating teachers in November 2022, almost a year and a half after Interview 5. (Due to scheduling conflicts and time constraints, I was unable to interview Linda Simmons). Interview 6 was designed to elicit teachers' experiences transitioning back to full-time in-person teaching as well as to member-check my interpretations of prior interview responses.

As such, Interview 6 protocol consisted of three parts. The first part consisted of lifeworld questions designed to elicit teachers' experiences transitioning back to classroom teaching and reflecting on the experience of schooling. The second part was informed by the recent publication of the National Assessment of Educational Progress scores showing "the biggest drop in math performance...since the testing program began in 1990" (Sparks, 2022) and subsequent media panic. Specifically, I briefly referred to the lower-than-typical scores and

asked, *Can you speak to any such gaps in mathematical knowledge with your own students that you feel like you can attribute to the pandemic?* (see Appendix). Lastly, consistent with the goals of reflexive longitudinal lifeworld interviews, the protocol included questions inviting teachers to reflect on past interview responses, as well as questions designed to member-check my interpretations of past interview responses. This last section looked different across teachers because of their varying responses in interviews 1-5.

2.3 Data Analysis

My overall design relies on constant comparative analysis (Boeije, 2002; Glaser & Strauss, 1967) both within- and across teachers (Charmaz, 2008) to understand teachers' professional transformations during the COVID-19 pandemic. These analysis methods support the emergent data collection inherent in RLLI research design.

Two methods of data reliability and validity are built into this study. First, the iterative process of interview data collection and analysis inherent in RLLI provided opportunities for continuous member-checking, inspiring confidence in the ecological validity of the within-teacher data (Emerson et al., 2011). Second, the triangulation of content analysis of relevant news stories, participant observation of teachers' department meetings, and interview data serves to situate the data for this study in the national narrative of teachers' experiences and each teacher's local context.

2.3.1 Constant Comparative Analysis

Aligned with my ethnomethodological approach (Emerson et al., 2011), data analysis centers participants' own meanings. After each round of interviews, I identified teachers'

sensemaking via open coding, consolidating themes across the interviews (Charmaz, 2008). For instance, a common dilemma emerged around engaging kids in synchronous online lessons: should teachers require that students' cameras stay on? On one hand, cameras leave students vulnerable, since peers see into their living spaces or screengrab awkward moments to post on social media; yet without students' faces, teachers struggle to gauge engagement. Discussing such dilemmas provides insight into developing responsive practice as teachers deliberated on what made the most sense for different teaching situations. Cross-case comparisons enabled me to identify clusters of responses (e.g., choosing primarily cameras off) and extrapolate conditions in which different instructional responses make sense.

2.3.2 Within-teacher Learning Analysis

Alongside group-level analysis, I developed learning portraits to understand how individual teachers' pedagogical judgments transform over time (Horn et al., 2013). I analyzed individual teacher interview data and fieldnotes from participant observations of department meetings to understand how each teacher's local, school-based contexts supported ongoing teacher learning over time.

2.3.3 Research Question 1: Negotiations of Pedagogical Responsibility

My understanding of pedagogical responsibility is rooted in the notion that is composed of both institutional and ethical commitments (Horn & Garner, 2022). To identify how the focal teachers draw on and negotiate their pedagogical responsibilities during the initial phases of the COVID-19 pandemic (RQ1), I conducted data analysis in two phases: (1) identifying institutional logics to develop conjectures and (2) conjecture testing.

2.3.3.1 Phase 1 Analysis: Identifying Institutional Logics

I first conducted content analysis (Altheide & Schneider, 2012) of transcripts of superintendent addresses, district and union memos, and video of bargaining agreement explanations to determine which institutional logics were interrupted, introduced, or maintained. To start, I archived all transcripts from superintendent updates from March 2020 to June 2021. Next, I used MAXQDA qualitative analysis software to perform line-by-line coding (see codebook in Table 2.4).

Code	Example
Changes to Policy	<i>The current grading policy, which gives students an additional six weeks to complete any missing work, acknowledges the unprecedented challenges students are facing while also recognizing their resilience and ability to overcome those challenges.</i>
References to Teachers' Experiences	<i>I want to give a special shout-out to classroom teachers who, in addition to planning lessons, teaching Zoom classes and providing support to students throughout the crisis, have taken on the task of helping students navigate technology issues, power outages and the like, all with a smile.</i>
District-wide Safety Protocols	<i>We've set up a COVID safety hotline anyone can call with questions or to report a concern or suggestion about school safety.</i>
Acknowledgment of Community	<i>Many families our schools serve have been impacted by the coronavirus. Housing insecurity and job uncertainty may lead to an even higher level of transiency than normal amongst students.</i>
Purpose of Schooling	<i>We have to balance the learning needs of students, the support we provide to working families and the responsibility to protect the health and safety of all in the school community.</i>

Table 2.4: Content Analysis of Superintendent Updates Codebook

Then, I cross-referenced the superintendent's mentions of policy changes and bargaining agreements with district and union memos. In instances where I could not access union memos, I watched archived videos of bargaining agreement explanations posted to the union's YouTube channel. Phase 1 analysis revealed several local institutional changes from March 2020 through

June 2021 (see Table 2.5). For each institutional change, I developed a conjecture about the relationship between each institutional change and teachers’ pedagogical responsibilities (Horn, 2020; see Table 2.5) based on my experiences conducting teacher interviews and preliminary analysis I did as part of RLLI.

Institutional Change	Conjecture
Flexibility within the structure of a teacher’s work day was introduced	C1: Because teachers have more autonomy with regards to how they design instructional minutes, they will draw on their ethical commitments more so than in-person schooling.
Total instructional minutes for classes was decreased	C2: Teachers will not be able to teach all of the content that they would in a typical school year, so they will draw on their pedagogical responsibilities when determining which content to cover and which content to drop.
For the remainder of the 2019-2020 school year, state and district standardized testing was eliminated	C3: Teachers could prioritize students’ emotional wellbeing without the pressure of covering content.
For the remainder of the 2019-2020 school year, a held harmless grading policy was introduced.	C4: Teachers may negotiate their conception of what grades mean in their practice.

Table 2.5: Research Question 1 Conjectures

2.3.3.2 Phase 2 Analysis: Conjecture Testing

To explore these conjectures, I used MAXQDA to perform line-by-line deductive coding of teacher interviews, allowing me to aggregate data across teachers and time to test each conjecture. After I developed a codebook for each conjecture, I coded and aggregated three teachers’ interview data, and a research assistant coded and aggregated five of the eight teachers’ data. The research assistant and I would meet periodically to calibrate our coded data. I operationalized C1 by looking for instances where teachers structured teaching activities differently during the pandemic compared to in-person teaching, as well as the ways they invoked moral stances or ethical commitments when structuring teaching activities. I also looked

for instances where teachers intentionally structured teaching activities the same as they did pre-pandemic to ensure data analysis (and my sensemaking) accounted for disconfirming evidence.

I operationalized C2 by identifying moments when teachers talked about making decisions regarding the content or discussed individual consequences of having fewer instructional minutes. Because of the emergent design of my interview protocols, I was able to incorporate these questions about these conjectures over the courses of my study to track teachers' evolving responses. For example, in Interview 3, I asked, *How were decisions made about content or curriculum?* This led to C2. Then, in Interview 4, I asked, *Compared to last year at this time, what percentage of the curriculum have you gotten to?* and *How have decisions about content – what to teach and when to teach it – been made?*

I operationalized C3 by identifying moments when teachers talked about students' social or emotional well-being and aggregated excerpts of teacher responses across time. Then, I explored potential connections to content, including lesson activities and assessments, in the aggregated excerpts. To account for disconfirming evidence, I also documented moments when teachers' discussion of socio-emotional wellbeing was not connected to content and investigated potential themes across the data.

Lastly, I explored C4 by identifying instances where teachers discussed their grading policy. Again, I aggregated teachers' responses over time, allowing me to investigate themes and connections within and across teachers.

2.3.4 Research Question 2: Conceptions of Good Teaching

To explore the relationship between the focal teachers' visions of good teaching and their agency to recreate their practice (or not) as they organized themselves in the figured world of

pandemic teaching (RQ2), I again engaged in two phases of analysis: (1) deductively coding interview responses to understand each teachers' vision of good teaching and (2) using constant comparison analysis (Boeije, 2002) to identify emerging themes among the focal teachers' changes in practice.

2.3.4.1 Phase 1 Analysis: Deductively Coding for Visions of Good Teaching

I first conducted content analysis of interview protocols to identify the questions that explicitly elicited teachers' conceptions of good teaching. Interviews 3, 4, and 5 each contained one such question (see Appendix for full protocols):

- Interview 3, Question 3:

What does it mean to be a good teacher right now? Have your ideas about what being a good teacher looks like had to change this year? In what ways?

- Interview 4, Question 16:

What does it mean to be a good teacher right now? Have your ideas about what being a good teacher looks like had to change this year? In what ways?

- Interview 5, Question 9:

What does it mean to be a good math teacher? In what ways do you feel like you've been a good teacher this year? Have your ideas about what being a good teacher looks like had to change this year? In what ways?

In Interview 3 and 4, teachers primarily responded with the relational aspects of good teaching they felt were salient to their practice. In Interview 5, I intentionally adjusted the question to include the qualifier "good *math* teacher" to better draw out teachers' content-specific notions of good teaching.

I then used MAXQDA to aggregate all teachers' responses to these three questions. For all teachers except for Kasey, I did not ask Question 16 in Interview 4 due to time constraints, so the data aggregated includes teachers' responses primarily from Interview 3 (October 2020) and Interview 5 (June 2021). I organized the data for each teacher into two categories: their visions of good teaching and any identified changes to their conception of good teaching. I then summarized each teacher's responses across all interviews in Table 2.6.

Teacher	Good Teaching	Description of Change in Conception of Good Teaching
Amber Singleton	<ul style="list-style-type: none"> •Protect students' social & emotional health •Creating an environment that students can get excited about learning in 	Ideas of good teaching have become more important but harder to accomplish
Brad Miller	<ul style="list-style-type: none"> •Caring for & knowing your students •Clearly communicating expectations by delivering an organized curriculum 	Being a good teacher has become harder
Ezio Martín	<ul style="list-style-type: none"> •Keeping students engaged •Attending to students' social & emotional needs 	Shift to attending to each student as a whole person
Jasmine Lin	<ul style="list-style-type: none"> •An empathetic teacher •Listening and responding to all students 	Shift from math focused to empathy focused in overall career
Jason Schulte	<ul style="list-style-type: none"> •Providing opportunity for students to learn material •Making material engaging & interesting for students •Following up with students to meet their needs •Strong grasp of mathematical content 	Similar but more difficult in the classroom
Kasey Zimmerman	<ul style="list-style-type: none"> •Being empathetic & building relationships •Meeting students where they're at •Being reflective •Getting students excited about math 	No change
Kirsten Nagi	<ul style="list-style-type: none"> •Attend to your own needs •Be enthusiastic & passionate about your work & math •Have a growth mindset for all students 	Change away from valuing traditional lecture when student teaching
Linda Simmons	<ul style="list-style-type: none"> •Creating a safe classroom space •Teaching students basic conceptual ideas of required curriculum •Create ways for students to recognize themselves as mathematicians 	Not a complete disconnect; the values haven't changed but the mechanics have

Table 2.6: Summary of Teachers’ Visions of Good Teaching from Interviews 3 & 5

2.3.4.2 Phase 2 Analysis: Constant Comparative Analysis

Next, I continued to utilize Constant Comparative Analysis (Boeije, 2002) to identify clusters and extrapolate themes across teachers. For example, I identified Amber, Jasmine, and Kasey as all prioritizing empathy (see Table 2.6). I then wrote a series of analytic memos (Emerson et al., 2011) describing the different themes, drawing from the research on good teaching described in Chapter 1 to theorize a process by which the participating teachers engaged in their visions of good teaching to recreate their practice. Lastly, I engaged in within-teacher learning analysis to develop learning portraits of teachers’ adjustments throughout the study.

2.3.5 Research Question 3: Sustained Changes to Practice

To explore how the focal teachers’ experiences influenced their instructional practice after the initial crisis of online teaching (RQ3), I first aggregated their responses to Interview 5 Question 7: *Is there anything you learned this year that you think you’ll take back into the classroom with you?* (see Table 2.7). As part of the RLLI method, I asked teachers to reflect on their responses in a series of questions in Interview 6 (see Table 2.7). I then identified the moments when teachers reported making the changes they had predicted they would (seen in italics in Table 2.7).

Teacher	Anticipated Changes to Practice (Interview 5, Question 7, June 2021)	Changes Actually Made to Practice (Interview 6, November 2022)
Amber Singleton	<ol style="list-style-type: none"> 1. Incorporating Desmos & other technology seamlessly and not as an add-on 2. <i>Rethinking assessment – potentially making them all open-note or take-home</i> 	<ol style="list-style-type: none"> 1. Trying to avoid using technology to make learning more tactile 2. <i>All assessments are open note</i>

Teacher	Anticipated Changes to Practice (Interview 5, Question 7, June 2021)	Changes Actually Made to Practice (Interview 6, November 2022)
Brad Miller	<ol style="list-style-type: none"> 1. Consistently <i>incorporating Desmos, Edpuzzle, and Screencastify</i> into your regular teaching practice 2. <i>Making time for personal check-ins with students</i> 	<ol style="list-style-type: none"> 1. <i>Using Desmos & Screencastify as back-pocket tools</i> 2. <i>Doing daily personal check-ins</i> 3. Incorporating new practices from Building Thinking Classrooms
Ezio Martin	<ol style="list-style-type: none"> 1. Focusing on the student as a “whole person” 2. Shifting your <i>grading to better reflect student effort</i> and understanding and stress testing and homework less 3. Incorporating Desmos into your teaching 	<ol style="list-style-type: none"> 1. <i>Manipulates grades to better reflect student effort over completion</i>
Jasmine Lin	<ol style="list-style-type: none"> 1. <i>Hosting all teaching/learning materials online, like in Google Classroom</i> 2. <i>Making all assessments computer-based</i> 	<ol style="list-style-type: none"> 1. <i>Hosting teaching & learning materials online</i> 2. <i>Making individual assessments computer-based, but keeping group and pop-assessments paper-based</i> 3. Using whiteboards to get students out of their seats
Jason Schulte	<ol style="list-style-type: none"> 1. Implementing Desmos 2. Using <i>gamer-grading</i> for all classes 3. Making personal connections with students 4. Implementing Zoom office hours 	<ol style="list-style-type: none"> 1. Uses Delta Math/online videos as a teaching resource 2. <i>Incorporating gamer/mastery grading concepts into teaching practices</i> for IM classes
Kasey Zimmerman	<ol style="list-style-type: none"> 1. Making it a priority to use Exit Tickets to drive your teaching and understanding of students’ knowledge 2. <i>Not assigning homework</i> 	<ol style="list-style-type: none"> 1. <i>Not assigning homework</i> because of a TikTok video
Kirsten Nagi	<ol style="list-style-type: none"> 1. <i>Taking advantage of technology more in day-to-day teaching</i> 2. <i>Teaching in a less structured way</i> to give students more independence in their learning 3. <i>Varying the types of assessment you give (e.g., not all summative quizzes)</i> 	<ol style="list-style-type: none"> 1. <i>Using technology much more frequently</i> 2. <i>Using less structure</i> but not yet fostering more independence 3. <i>Using project-based assessments</i> 4. Using Desmos regularly and veering away from the textbook
Linda Simmons*	<ol style="list-style-type: none"> 1. Incorporating after-hours Zoom meetings with students 2. Learning how to use Desmos to create a technology-based mathematical learning environment 	

Note. Italic lettering indicates the practices that were sustained; teachers accurately anticipated that they would continue these practices, which was confirmed in the November 2022 interview.

*Linda Simmons was unable to participate in Interview 6 due to scheduling conflicts.

Table 2.7: Comparison of Teachers’ Anticipated to Actual Changes to Practice

In between Teachers’ November 2022 interviews, I wrote analytic memos describing the nature of their current teaching practices, during which analytic themes emerged. Specifically, I found that teachers talked about their current practices in three ways: (1) taking up old practices that they had not used in a while, (2) adding new practices to their repertoires, and (3) pausing the use of practices they had engaged in previously. I then deductively coded interview data to identify instances in which teachers discussed their current practices in any of these three ways. Drawing from Horn (2020), I then conducted a second round of coding to identify teachers’ pedagogical reasoning for engaging in their teaching practices in these ways.

In the next three chapters, I will describe the findings that emerged from this analysis. The chapters include quotes from the transcripts. In sharing teachers’ reflections, I prioritized clarity over representing details of spoken language. For example, filler words (e.g., um, like) and false starts were edited for readability. Because my interest was in teachers’ experiences, these metalinguistic details were not central to my analysis. In the interview excerpts that follow in the findings chapters, I use the following formatting conventions:

Convention	Purpose
[...]	More than 3 words were removed from the interview excerpt
...	A long pause
–	An abrupt change in speech pattern or stop in speech
[]	Quoted words slightly modified (e.g., tense) or added for clarity
<i>[italic]</i>	Contextual notes added for clarity

Table 2.8: Formatting Conventions for Interview Excerpts

As is the case with the representation of any qualitative data, the crafting of finished quotes is necessarily a highly interpretive, analytic act (Lareau, 2021). While I attempted to

manage some bias in interpretation by having members of the research team review the final excerpts for clarity and accuracy, it is important to note the subjectivity of qualitative data representation.

CHAPTER 3

The Authoring Spaces of Pandemic Teaching

“It’s not going to be the same as what it was. We have a different job now.”

–Amber Singleton, high school mathematics teacher, May 2020

It is well documented that there are numerous inequities entangled in institutional structures of schooling (Horn 2018; Milner, 2021). As the education field reckons with the resulting opportunity gaps that produce unjust schooling practices, the ongoing COVID-19 pandemic thrust educational inequality into the spotlight. Exacerbated by the pandemic, inequities associated with access to food, shelter, and healthcare as well as income insecurity have amplified opportunity gaps in teaching and learning (García & Weiss, 2020). At the same time, students’ lives during the initial years of COVID were also marred with injustice as they witnessed multiple public police killings of Black citizens, an uptick in anti-Asian violence, and an insurrection in the seat of the U.S. government. All of these aspects heightened widespread anxiety and anger across the country, complicating the already uncertain shift to online schooling teachers had to negotiate.

In this chapter, I ground my understanding of teaching and teachers’ interaction with the world as pursuing *responsive teaching practices*: those driven by the needs, experiences, identities, and learning of particular students in particular subject areas in particular moments in particular settings (Horn et al., in press). Specifically, COVID-19 altered teaching contexts and changed students’ needs, thereby changing what teachers had to respond to; this study examines how they made sense of and navigated the complex contexts in the wake of the crises posed by

pandemic teaching. As I will explain more below, I take a socially constructed view of teacher agency as a function of their participation in figured worlds to explore how teachers' institutional commitments, and thus their pedagogical responsibilities, may have shifted during this time. In particular, I will address Research Question 1 — *How did the focal teachers draw on and negotiate their pedagogical responsibilities during the initial phases of the COVID-19 pandemic?* — by analyzing and discussing the institutional and ethical commitments teachers drew on or negotiated during the duration of this study.

3.1 Achieving Agency in Pursuit of Responsive Teaching

This chapter centers teachers' agency as they responded to the ever-changing and uncertain educational and social environment during pandemic teaching, driven to better serve their students' needs (Deed et al., 2020; Ehren et al., 2021). As I described in Chapter 1, the post-NCLB U.S. education system has been regarded by institutional analysts as a tightly coupled organization characterized by the control and surveillance of teachers by higher levels of the system, resulting in bounded teacher autonomy (Coburn, 2004). In this study, teachers were constantly navigating the pressures and tensions between their local contexts and institutional responsibilities of the accountability era (Coburn, 2004). In this chapter, I shift from a discussion of teacher autonomy toward a discussion of teacher agency to better account for the unequal power relations borne from such a tightly coupled institution. In particular, *agency* is typically used to describe self-direction embedded within a broader system and acknowledges the interplay between actors and systems (Clarke et al., 2016).

Researchers in the field of education have long attended to the situative nature of agency. Bourdieu (1977) first introduced the idea of *structure-agency dialectic*, or the notion that there is

a recursive loop between one's actions and social structures (Calabrese Barton et al., 2010). Biesta and Tedder (2007) argue that the “achievement of agency will always result from the interplay of individual efforts, available resources and contextual and structural factors as they come together in particular and always unique situations” (p. 137). Clarke and colleagues' (2016) hybrid model of agency — composed of both intention (drawing from psychological traditions) and capability (drawing from sociological traditions) — acknowledges an individual conception of agency as shaped in social interaction and situated within social systems. These authors' attention to broader ecological conditions and individuals' roles within them speak to a modern conception of agency as something people *achieve*, rather than something individuals *possess*. In other words, teachers' contexts can influence whether action is (or is perceived as being) possible — it is not that an individual does (not) possess agency; it is that their actions are filtered through situated particulars of their unique context. However, a common critique of these conceptions of agency is that they do not account for the dynamic of power and control that permeates the U.S. education system (Calabrese Barton & Tan, 2010; [Rainio, 2008](#)). Indeed, a discussion of teacher agency would be incomplete without an examination of institutional control and the resulting power dynamics at play.

3.1.1 Teacher Agency and Figured Worlds: A Culturally Situated Approach

To understand agency as a situated phenomenon, I turn to Calabrese Barton and Tan (2010), who theorize agency through the lens of Holland and colleagues' (2001) conception of figured worlds to highlight both the “socially transformative nature of agency and the intersecting roles of context, position, knowledge, and identity with agency” (Calabrese Barton & Tan, 2010, p. 191). By *figured worlds*, I refer to the particular set of meanings, practices, and

actors that are recognized and assigned significance in particular settings or among cultural groups (Calabrese Barton & Tan, 2010; Holland et al., 2001). Figured worlds are socially organized and reproduced, offering form and meaning to people’s lives. Calabrese Barton and Tan (2010) offer a framework for the relationship between figured worlds, agency, and identity: “Agency is at once the possibility of imagining and asserting a new self in a figured world at the same time as it is about using one’s identity to imagine a new and different world” (p. 192; see Figure 3.1). In other words, figured worlds offer possibilities to examine how contexts transform people’s identities and how people try out new identities (or modify their existing identities) to help transform contexts.

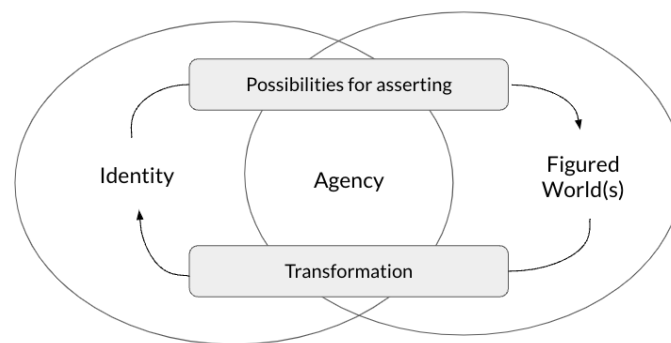


Figure 3.1: The relationship between agency, identity, and figured worlds (Calabrese Barton & Tan, 2010)

As individuals participate in figured worlds, they must still work within the constraints of power and position. In this sense, we can view agency as unfolding in people’s actions within institutional practices, which carry with them historically accumulated demands (Edwards et al., 2017). Importantly, people do not passively exist within their environments; instead, as Edwards and colleagues describe, “we are sense-makers, purposefully seeking meaning and trying to position ourselves so that we are competent and able to act in the world” (2017, p. 231). In this way, as people take action and exert their agency, they might *navigate* around the barriers borne

from such demands or they might *negotiate* their positions within them (indicating a greater opportunity to exercise agency; Edwards et al, 2017). As the authors put it, teachers have “to make sense of the figured worlds of the schools and negotiate their positions in them, or, failing that, navigate around the barriers they encounter” (Edwards et al., 2017, p. 232).

As teachers navigate or negotiate the demands of their institutions, they transform and (re)define their teaching practice according to their pedagogical responsibilities (Chen et al., 2021; Horn & Garner, 2022). Appropriate for this study, I view pedagogical responsibility as highly personal, composed of both institutional and ethical commitments, and deeply connected to individuals’ self-meanings and identities (Burke & Reitzes, 1991). Examining teachers’ agency in their figured worlds through the lens of pedagogical responsibility accounts for the power dynamics at play that other conceptions of teacher agency omit. In particular, we can view teachers’ figured worlds as composed of institutional demands (among other meanings, practices, and actors). As teachers make sense of these figured worlds, they can either *draw on* their pedagogical responsibilities to navigate around such institutional barriers or *negotiate* their pedagogical responsibilities to transform their identities in response to their contexts (see Figure 3.2). Pedagogical responsibility offers a framework with which to understand how teachers may draw on or negotiate elements of their identities — or, aligning with Edwards and colleagues, navigate around barriers or negotiate their positions — as they participate in figured worlds by attending to the interplay between teachers’ ethical and institutional commitments.

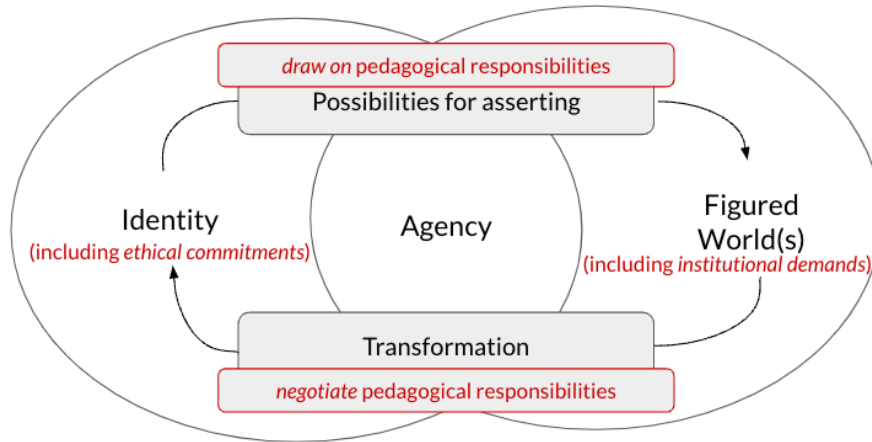


Figure 3.2: Relationship between pedagogical responsibility (displayed in red font) and Calabrese Barton & Tan's (2010) culturally situated approach to agency

For example, throughout this study, teachers described tensions in their responsibilities, as they balanced institutional demands for instructional time with ethical demands of care: “We’re going to assume that everybody’s going through some crap right now [...] When we call home, our first question is going to be, ‘Are you okay?’ not, ‘We noticed you didn’t do your math’” (*Linda, Interview 1, May 2020*). This example highlights the salience of pedagogical responsibility to teachers’ sensemaking and actions. It also points to how examining teachers’ pedagogical responsibilities provides insight into the relationship between their identities (e.g., as a caring teacher) and agency (e.g., checking in first) as they participate in their figured worlds.

3.1.2 Figured Worlds, Agency, and Identity in COVID-19

This study seeks to represent teachers’ sensemaking during and after their transition between two distinct time periods, what I refer to as *Before COVID-19 Era* (BCE), and *COVID-19 Era* (CE), which begins in March 2020 with the first announcement of school closures and is ongoing to this day. Scholars have considered the figured worlds of BCE school practices to be

inflexible, leaving little room for the reorganization of teachers' identities and agency. The tightly coupled nature of schooling prioritized stability within the school day and among school participants in the pursuit of productivity (Edwards et al., 2017). Yet, this presumed stability was ruptured by the COVID-19 pandemic, making room for teachers to reorganize themselves into a new figured world of online teaching. In this sense, all teachers were novices to the CE figured world, offering a unique opportunity to analyze authoring spaces in their teaching practice.

An individual's *authoring space* is driven by a sense of agency, and its boundaries are determined by how they "choose to accept, engage, resist, or ignore appropriate dispositions tagged to their identities" (Calabrese Barton & Tan, 2010, p. 193). The ways that teachers take up or reconstruct identities ascribed to them by the moment and context are both driven by and drive the possibilities for asserting agency within the new figured world of pandemic teaching. Learning scientists have grown to recognize the importance of such authoring spaces to understand the interactions and potential tensions between teachers and their contexts.

It is important to note that most teachers in this study held leadership roles in their schools, departments, or grade-level teams. Viewing agency as an interplay between teachers' identities and figured worlds offers some insight into the ways the teachers in this study wielded their power (or stepped down) to assert agency at a time when some of the institutional demands that had previously constrained them got lifted. In other words, these teachers were already in positions to reorganize themselves in agentic ways because of their professional standing in their schools; an understanding of agency as socially transformative necessarily calls attention to these teachers' positions of power as they participate in their figured worlds of pandemic teaching.

3.2 The Authoring Spaces of Pandemic Teaching

Consistent with a culturally situated approach to agency that accounts for institutional contexts, I investigated the local and national policy changes that took place from March 2020 through June 2021 to get a sense of teachers’ institutional obligations and the possibilities for agency within them. As described in Chapter 2, content analysis of relevant policy documents revealed four such changes, which prompted the development of four corresponding conjectures (see Table 3.1).

Institutional Change	Conjecture	Authoring Space
Flexibility within the structure of a teacher’s workday was introduced	C1: Because teachers have more autonomy with regard to how they design instructional minutes, they will draw on their ethical commitments more so than in-person schooling.	Structuring Time
Total instructional minutes for classes were decreased	C2: Teachers will not be able to teach all of the content that they would in a typical school year, so they will draw on their pedagogical responsibilities when determining which content to cover and which content to drop.	Content
For the remainder of the 2019-2020 school year, state and district standardized testing was eliminated	C3: Teachers could prioritize students’ emotional wellbeing without the pressure of covering content.	Structuring Time, Content, and Grading
For the remainder of the 2019-2020 school year, a held-harmless grading policy was introduced.	C4: Teachers may negotiate their conception of what grades mean in their practice.	Grading

Table 3.1: Summary of Phase 1 Analysis and Emerging Authoring Spaces

As I organized the data to test each conjecture, three main authoring spaces in the CE teaching world emerged: *Structuring Time*, *Content*, and *Grading*. An analysis of each authoring space highlights the ways that teachers reorganized their identities and practices with respect to

specific elements of CE teaching, in this case allowing for a more thorough understanding of the ways they structured academic time, selected mathematical content, and conceptualized grades.

The authoring spaces of CE teaching also provide a framework with which to investigate my analytic conjectures. In the first authoring space, structuring time, teachers talked about their time in ways that attended to students' wellbeing and allowed them to prioritize their ethical commitment to care, confirming C1. In the second authoring space, content, teachers also drew from and negotiated their pedagogical responsibilities in pursuit of relational agency, relying heavily on their local professional communities to make content decisions (C2). Interestingly, C3 was confirmed across all spaces; the data revealed that teachers continually prioritized students' wellbeing as they reorganized their identities in their figured worlds. Lastly, I found that teachers negotiated through and navigated around institutional barriers to reorganize their orientations toward conventional grading as they authored their identities in the grading space (C4).

In the remainder of this chapter, I will explore the possibilities for teacher agency within these authoring spaces provided by pandemic-related institutional changes. First, I will describe the ways that teachers negotiated their pedagogical responsibilities to prioritize their ethical commitments to care across all three authoring spaces. Then, I will show how teachers drew from their pedagogical responsibilities as they asserted relational agency in the content space. Lastly, I will describe two ways that teachers navigated around institutional constraints in the grading space. Collectively, the following sections will highlight the ways that CE institutional changes shaped teachers' new figured worlds by exploring how teachers drew on or negotiated their pedagogical responsibilities — or asserted agency — as they reorganized their identities.

3.3 Negotiating Pedagogical Responsibility Across Spaces: Prioritizing Students' Wellbeing

Teachers prioritized students' social and emotional wellbeing in their overall thinking about teaching in ways that they had not before the pandemic. They discussed the ways that the circumstances necessitated such a shift, pointing toward their responsiveness. Specifically, teachers valued their ethical commitments more to meet the demands on their students who were living and learning through a global pandemic. As Kirsten described,

Somehow it feels just a whole lot different now than it was back then. I think before when I was doing in-person teaching, I could only catch a glimpse of understanding where the students were at, personally [...] And now with online learning and with the pandemic, how it affected everyone, I think I just hit a point with really trying to come to an understanding of what students are going through [...] A lot of students just want their teachers to know that they're doing things other than school, and they're trying their best.

And it's like, "Right, that really is the main point of this all" (*Interview 2, August 2020*).

In this excerpt, she explained how this world is "different" than BCE teaching, where she admitted to not understanding much about students' personal lives. She made a comparison to the CE teaching and the effects of COVID-19 on students' lives, and described a negotiation of her responsibility to understand what students are going through.

Several other teachers echoed Kirsten's sentiments. For example, Ezio reflected on how teaching during COVID helped him to realize he needed to focus on "the student as a whole person." This shift in focus was noticeable in his discussion of many of his teaching practices, like not expecting a student to do their homework after he found out their father died, or finding out that a student was experiencing depression and attributing his failing grade to the fact that "his social and emotional wellbeing is not being met" (*Interview 4, March 2021*).

All teachers in this study reported negotiating their pedagogical responsibilities to prioritize their ethical commitments to care more so than they had before the pandemic. One explanation for this finding could be a move toward *critical caring* (Rolón-Dow, 2005) as a response to the critical social ruptures made visible during the pandemic. As I described in Chapter 2, the student population in this study was left exceptionally vulnerable to the multiple social and racial pandemics that emerged during CE. The teachers came to acknowledge the sociocultural and political circumstances and conditions their students faced and reorganized their identities as teachers of Los Angeleno kids, asserting agency by bringing critical caring practices to the forefront of their pandemic teaching worlds.

3.3.1 Prioritizing Students' Wellbeing in the Structuring Time Space

As discussed above, the teachers' workdays became more flexible in the CE teaching world. In practice, this meant that teachers could take some liberties with how they structured time with students. For example, if a teacher was scheduled to teach a class for 90 minutes, the teacher could compose that 90 minutes with 20 minutes of synchronous lecture followed by 70 minutes of independent work that could be a combination of synchronous or asynchronous.

Teachers in this study asserted agency by structuring their class time in ways that attended to students' wellbeing as a result of negotiating their pedagogical responsibilities to prioritize their ethical commitment to care. For example, Amber often spoke of her responsibility to prioritize students' social and emotional health during the pandemic. She thought critically about what it meant to be a teacher who recognized students' lives during this time:

I only get 80 minutes whether they're asynchronous or synchronous, I get 80 minutes every other day. So sometimes I'm only seeing them two times in that week. How can I

make it engaging where they're going to be there with me and enjoy being there?

(Interview 3, October 2020)

Amber later described the variety of ways she used this time to create a supportive space for her students' personal needs, like in this explanation of how she used warm-up questions:

Some days I'll just ask how they're feeling, other days I'll ask them something personal about themselves. I might ask what they're looking forward to that weekend or I might ask their favorite something-or-other. And every day there's just a new question and I'll talk about their answers, or sometimes we'll present them and there's a word cloud we'll look at with what everybody said or something *(Interview 3, October 2020)*.

Similarly, Jason described having informal, non-mathematical conversations at the beginning of his classes. When he talked about balancing time teaching content with making personal connections, he said:

I don't have an issue if we talk for 10, 15 minutes if its keeping students engaged. Like if they're interested in it, yeah, let's talk about it and then whatever we get through in the lesson, we'll get through. It's more important that we're making that connection than that we get through the content" *(Interview 3, October 2020)*.

In these examples, Amber and Jason both asserted agency in the way they structured their time with students, prioritizing support and personal connections over mathematical instructional time.

3.3.2 Prioritizing Students' Wellbeing in the Content Space

Several teachers in this study reported having strong mathematical identities before the pandemic. As Ezio said, "I like to think kids can see some passion in me towards math [...] I

want to show them anyone can do math; it's not just for a certain group of people" (*Interview 5, June 2021*). Yet, as teachers negotiated their pedagogical responsibilities in ways that brought their ethical commitments to students to the forefront, many described loosening their stronghold on the teaching of *mathematics* in ways that they hadn't before. For example, Linda prioritized personal connections over her pre-pandemic commitment to mathematics:

I teach mathematics. I care deeply about my kids and I believe in all that stuff, but I am never one of those teachers who go, "Well, I don't teach content, I teach children." That's not me. I wouldn't be a teacher if I didn't get to teach math. I love math. I love teaching, but I love teaching math. But right now, I'm going to make a paper wig and show up as Mozart because it makes the kids laugh (*Interview 1, May 2020*).

Kasey expressed a similar sentiment when he said, "It's just really hard for me to see the importance of specific math with the pandemic," later elaborating, "Students are not going to look back and be like, 'Whoa, I wish I had learned this.' I think what's important is that students feel like we care about them and that we're there for them" (*Interview 3, October 2020*).

In these excerpts, we can see the ways that teachers reorganized their place in their pandemic teaching worlds by negotiating their pedagogical responsibilities, ultimately asserting agency by valuing supporting students' wellbeing over teaching mathematical content.

3.3.3 Prioritizing Students' Wellbeing in the Grading Space

Teachers also asserted agency in the grading space by negotiating their pedagogical responsibilities to attend to their ethical commitments over the institutional demands of assigning grades. As Brad described in Interview 2, "It's just going to be grading obviously at your

discretion, being mindful about kids' situations” (*August 2020*). In practice, Brad exhibited such discretion by eliminating consequences for assignments turned in late:

And there are some kids that are like, “Sorry, Mister. I've not been here the whole semester. I'm going to do better.” And you see them submit six assignments in a weekend. And it's like, “Okay, good.” Never too late. No late assignments the whole semester, as long as they're in by December. That's my mindset this year is like, “If you submit it, at some point, I'll grade it and just stick with it” (*Interview 3, October 2020*).

Jasmine also explained her commitment to kindness when she said, “I decided to give credit in terms of extra credit, so that it doesn't harm their grade at all, and anything that they do, I will take it [...] because I want to be kind right now” (*Interview 1, April 2020*). When teachers thought about grades in their figured worlds of pandemic teaching, they negotiated their pedagogical responsibilities, changing the balance between institutional traditions of grades and their ethical commitments to care to better serve their students’ personal needs.

These examples show the ways that the teachers in this study reorganized their ethical commitment to care, bringing non-academic elements of their teaching identities to the forefront of their figured worlds.

3.4 Relational Agency in the Content Space

During the time I conducted interviews, the total number of instructional minutes teachers had for each of their CE classes was less than the number of instructional minutes during BCE. Importantly, the district gave no direction as to what content to teach or cut, and teachers experienced having “more autonomy” (*Jasmine, Interview 3, October 2020*) to make content and pacing decisions on their own.

In this study, teachers relied heavily on their local professional communities to make content decisions, thereby asserting relational agency (Edwards et al., 2017). In this discussion of *relational agency*, I draw from Edwards and colleagues' definition, which describes it as when "resources of more than one practice are brought into play rapidly to work on a complex problem" (p. 234). Relational agents draw on relational expertise and resources to quickly expand their understanding of the problems they face to work with each other. As the teachers in this study navigated and negotiated content decisions in their figured worlds of pandemic teaching, they valued alignment with each other.

For example, Ezio reported that his grade level team decided together to not teach the grade's geometry standards. When weighing the decision, he said that he and his team asked questions such as, "What do we value? What are the core standards that we think [the students] have to know? What are we willing to sacrifice and hope that they'll learn it in the next grade level?" (*Interview 4, March 2021*). By raising these questions with his colleagues, Ezio drew from their individual experiences to collectively reorganize their positions as teachers of mathematical content in their worlds.

Kirsten also relied on her school-based math department, which took a different approach to content decisions, opting to follow the typical sequence of standards, with the understanding that they would not get to standards that were typically taught at the end of their classes. She explained: "at our school, our department...want[s] to make sure that we stay in the same sequence" (*Interview 3, October 2020*) but that "we're pretty much all agreed that wherever we get to, it's fine" (*Interview 4, March 2021*).

Jasmine described aligning herself with two levels of professional community: district and school based. She was a member of a district-wide math sub-committee that met during the

summer of 2020 to “come up with a list of big ideas that we know we have to cover for each class” (*Interview 2, August 2020*), asserting relational agency through content *choice* at the district level. She further asserted relational agency through content *sequence* at her school level:

In terms of how [the list of big ideas] gets executed and how that gets interpreted at each site, it's probably different. So at least with my department, with the freshman class that I am teaching they told me we're not going to start out with stats. The other schools wanted to start out with stats because for the election and what not. But we're just going through the book (*Interview 2, August 2020*).

In these examples, Ezio, Kirsten, and Jasmine showed relational agency by determining content decisions with the other members of their professional communities, drawing from individuals' expertise to quickly determine their group's actions.

Importantly, teachers still drew from and negotiated their pedagogical responsibilities in pursuit of relational agency. In interviews, Ezio spoke to his commitment to adequately prepare his students for high school:

What's really bothered me in the past, [was] a high school kid coming back, saying, “You never taught me this topic.” I just don't want to hear that because that means that I didn't do my job. But then again, from experience, when you just try to cram everything in, they don't learn it. (*Interview 3, October 2020*)

He carried this commitment to prepare students for high school mathematics content to his professional community as they wrestled with content decisions. His grade level team ultimately asserted relational agency by taking this commitment into account: they agreed to bypass teaching geometry standards in favor of covering standards necessary for high school algebra courses more deeply in order to better meet the needs of their specific student population.

In this section, I showed how teachers collectively reorganized their positions as teachers of mathematical content, asserting relational agency (in some cases on multiple levels). In pursuit of such relational agency, teachers still drew from their individual pedagogical responsibilities.

3.5 Asserting Agency in the Grading Space

For the remainder of the 2019-2020 school year, a “held harmless” grading policy was introduced by district leaders, meaning teachers could not assign students a final grade lower than their grade in the class on the last day of in-person teaching. While this policy was not upheld by the district for the 2020-2021 school year, many schools adjusted their grading policies in an attempt to meet the demands of teaching and learning during a pandemic. For example, Rees Middle School implemented a policy where 50% of a student’s grade was from their homework, 35% from classwork, and 15% from quizzes. The policy was intended to take the pressure off students to perform well on assessments and instead shift the value to the work they did at home independently. However, consistent with national trends (Thompson, 2020), the teachers in our study still saw a decrease in students’ grades, as Linda described in Interview 4: “We definitely have more kids failing than in a typical year” (*March 2021*).

In the figured world of pandemic teaching, this change in grading policy represented a shift in institutional control that prompted teachers to reorganize their positions in this world by drawing on or negotiating their pedagogical responsibilities. As Ezio described, “COVID changed everything. I think it's being very unfair trying to hold them to the same standards that you had in the physical classroom” (*Interview 4, March 2021*). I found that the teachers in our study asserted agency in two ways: by (1) negotiating their pedagogical responsibilities to

reorganize their orientations to conventional grading and (2) drawing on their pedagogical responsibility to use grades to reflect students' understandings to navigate around grading policy barriers.

3.5.1 Negotiating Institutional Responsibility to Grades

As teachers reconstructed their identities with respect to grades, they negotiated their pedagogical responsibility to reorganize their orientations to conventional grading practices. Jasmine negotiated her pedagogical responsibility to value kindness and participation over adhering to a strict grading policy. Later in the study, she voiced a shift in her conception of grades themselves:

My definition of an A has changed. I don't know. I guess I'm just really happy that they come to class and are actually there and respond to me and turn in their assignments and ask me questions. That's all I want right now. Yeah, I guess my definition of an A has changed. (*Interview 4, March 2021*)

In this example, Jasmine described a change in her commitment to grades from before the pandemic to now, placing a higher value on students' participation through responding and asking questions.

Like Jasmine, Ezio's conceptions of grades changed. He described grades as having "no value," arguing that it was impossible to wade through the myriad variables that could contribute to a student's failing grade, such as limited access to technology or their personal needs not being met. In interviews, he actively negotiated his responsibility to grade students. When asked how he is thinking about grading in Interview 3, he responded:

I might just say, “Here’s your exit ticket. What grade do you think you deserve? Do you think you deserve an A? I’m willing to give you an A, tell me why you think you deserve it.” Or, something like that (*October 2020*).

Later in the study, he offered a different solution to the problem of grading:

Maybe everything should just be pass/fail this year. This is not the year to be caught up in the grades. Heck, give them all A’s. You know what? Maybe I’ll just do that. I didn’t even think about that. Maybe just give everybody an A. We’ll see (*Interview 4, March 2021*)

He ultimately asked students what grade they thought they deserved while also implementing his own version of a hold harmless grading policy: “I did not give them a lower grade. But the ones who felt they deserved a higher grade, I gave them a higher grade” (*Interview 5, June 2021*).

The examples of Jasmine and Ezio show the ways that teachers asserted agency within the boundaries of grading. Jasmine negotiated her ethical commitment to kindness, ultimately asserting agency by changing her definition of grades to better account for students’ participation. In Ezio’s figured world of pandemic teaching, grades had no value, prompting him to question his methods of conventional grading.

3.5.2 Navigating Around Institutional Barriers

While the pandemic offered opportunities for teachers to negotiate their pedagogical responsibilities with regard to grades, some still had to work within institutional constraints. For example, Jasmine described feeling constrained from teaching from a place of empathy because of her district’s scheduling requirements:

Maybe it's because the district has lopped on all these expectations, and so I feel like I have to be as effective as I was during regular school. Because we have all these schedules and stuff [...] like the bell schedule that we have and like homeroom and— So I feel like people are talking less about practicing empathy now. Like it's sad, right?

(Interview 2, August 2020).

When reflecting on the relationship between institutional demands and grading, Jasmine elaborated, “it just really got me thinking. Grades at the end of the day, it's part of the system, when it [should be] really just how much they're learning” *(Interview 5, June 2021)*.

In response to such demands, teachers asserted agency by drawing on their existing pedagogical responsibilities to navigate around institutional barriers. They aimed to do so in ways that aligned with their commitments to use grades to reflect students' understanding while “add[ing] another extra level of empathy to it” *(Amber, Interview 4, March 2021)*. Consider Ezio, who came to describe his grades as “very skewed” because “the grade is way too weighted towards the homework” *(Interview 4, March 2021)*. This reflects a tension between institutional meritocratic ideals that value homework completion (Calarco et al., 2022) and Ezio's pedagogical responsibility to use grades to measure students' mathematical understanding. He felt that “95% of the kids deserve a C or better, but if I take into account [their homework and quizzes], I have more than a half a C, D, or an F. It's not reflective of what I see in Desmos” *(Interview 4, March 2021)*. Ezio identified his departmental grading policy as a barrier and ultimately asserted agency by drawing on his pedagogical responsibility to use grades to reflect students' mathematical understandings, thus going against his department³:

³ In interviews, Ezio used the word *department* as a metonym for the instructional leader at his school that made the policies (including the grading policy) for the school's math department.

How do I follow what the department wants to do, but at the same time, it's just not right? I think at the end of the day when the final report cards come in, I'm just going to go against the department in the end [...] As long as the department doesn't find out, I'll be okay (*Interview 4, March 2021*).

Another way teachers navigated around the institutional barrier of grades was to overhaul their grading system to better reflect their pedagogical responsibilities while still adhering to their obligation to assign grades. Some teachers migrated from traditional grading towards mastery or standards-based grading, where students don't transition to a new standard until they can show mastery of the current one. Kirsten talked about "why mastery grading would be very helpful," citing examples of ways that mastery grading can be more student-driven and less overwhelming:

I've always heard from students at my school how they always felt that it just feels too overwhelming [...] So I think it's just being a little bit more strategic in what's being assigned and ensuring that they understand it before they get to where they feel like they can move on to another topic (*Interview 2, August 2020*).

Jason similarly adopted mastery grading, allowing his students unlimited opportunities to reassess for any given standard until they have shown mastery. However, he found that needing to create and recreate assessments was too time-consuming. Instead of reverting to traditional grading, Jason remained steadfast in his pursuit of ways to navigate around the barriers of grading systems. In January 2021, he adopted yet another new system of grading he refers to as Gamer Grading. In this system, a "badge" is available to students every week. To attain a badge, students need to pass an assessment aligned to the standards covered that week. As Jason explained,

Their grade is just how many badges they have at a certain point. So at the end of last week, they needed to have eight badges for an A, and then at the end of this week it would probably be nine badges for an A. And then on down. So they know exactly how many they need for each grade, and each badge is the material from one or two lessons that week (*Interview 4, March 2021*).

This system differs from mastery grading in that students can choose when they attempt to attain a badge, and they have unlimited attempts for each badge. This system drew on Jason's commitment to letting students learn at their own pace while still adhering to the district policy of assigning letter grades:

You can fail on it 10 times, but if you pass it that 11th time, you're still you've passed that level and you can move on. So if they want, this week they feel like, "Yeah I really understood this stuff, let me take the one from this week." So they can really do whatever they want, and I like that aspect of it. It's up to you when you want to complete the work and master that topic (*Interview 4, March 2021*).

Brad and Linda both shifted from traditional grading to project-based grading. As Brad described, "A kid shows up for a test and just doesn't know anything because they haven't been here, and they fail. At least [with projects] I should be able to hopefully guide some kids in the right direction" (*Interview 2, August 2021*). Like the previously described teachers, Brad drew on his commitment to using grades as an actual measure of students' mathematical understanding and not as a proxy for attendance to inform this shift. Likewise, Linda used project-based grading to embrace the relative uselessness of grades in her pandemic teaching world:

Somebody said, "I hope we all can finally agree that grades are bullshit." I'm going to be an early adopter of that and just embrace that. And certainly, I almost feel like I want to

do quizzes, but I almost want to treat them as entirely formative and informative. And that's not [their] grade. All the grades are going to be project based and then thinking about, okay, but, what project can I give them where I'm not privileging the kids whose mom is going to go buy them a \$5 compass from Home Depot or something (*Interview 2, August 2021*).

In this section, I showed the different ways that teachers drew on their pedagogical responsibilities to use grades as representations of students' mathematical understandings to navigate around district grading policies. In particular, teachers in this study asserted agency in two ways: Ezio eschewed the meritocratic ideals of his department's grading policy by not counting homework or assessment in his final grades. Other teachers overhauled their grading system to better reflect their pedagogical commitments to not overwhelming students, allowed students to work at their own pace, and used grades as measures of mathematical understanding.

3.6 Discussion

In this chapter, I examine the research question: *How did the focal teachers draw on and negotiate their pedagogical responsibilities during the initial phases of the COVID-19 pandemic?* To do so, I take a socially constructed view of teacher agency as a function of teachers' participation in figured worlds to explore how teachers' institutional commitments may have shifted. Specifically, I explored the possibilities for teacher agency within the bounds of the authoring spaces that emerged in light of institutional changes.

Three main findings emerged. First, I found that the teachers in this study reorganized their ethical commitment to care, bringing non-academic elements of their teaching identities to the forefront of their figured worlds. Second, I found that teachers collectively reorganized their

positions as teachers of mathematical content, asserting relational agency while drawing on their pedagogical responsibilities. Lastly, I found that some teachers negotiated their pedagogical responsibilities to reorganize their orientations to conventional grading, while others drew on their pedagogical responsibility to use grades to reflect students' understanding to navigate around grading policy barriers. Taken together, these findings speak to the ways that teachers asserted agency by drawing on and negotiating their pedagogical responsibilities during the initial phases of the COVID-19 pandemic, highlighting the interplay between teachers' ethical and institutional commitments (see Figure 3.2).

This study takes place during a time when COVID-19 altered teaching contexts and changed students' needs; thus, my understanding of teaching and teachers' interaction with the world as pursuing responsive teaching practices (Horn et al., in press). However, the implications of the findings described in this chapter apply to a much broader narrative of teaching. Specifically, this chapter can be considered a counter-narrative to existing notions of teaching in urban settings. Scholars of urban education have argued that urban school systems are run by bureaucracies that result in "teachers, students, and parents have[ing] less access to decision making and are more isolated from one another" (Weiner, 1999, p. 16). Yet, in the fixed period of time that is pandemic teaching, the ways teachers asserted agency are inconsistent with the common ways that people think about urban teaching. In other words, the pervasive narrative of urban education is that teachers in urban settings are bound by a bureaucracy that is cut off from the communities they are supposed to serve, resulting in a teaching environment characterized by contradiction (Weiner, 1999). The analysis described in this chapter presents a different narrative in which teachers asserted agency by navigating around or negotiating their positions within institutional barriers as they drew on their pedagogical responsibility to their students and

community. The teachers in this study prioritized their commitment to teaching students of Los Angeles by acknowledging and responding to their needs in ways that broke through traditional notions of educational bureaucracy.

CHAPTER 4

Tinkering, Tipping Points, and Survival: An Examination into Teachers' Visions of Good Teaching and their Agency to Recreate Practice

“The transition to online learning is the equivalent of trying to fly an airplane while changing the seats and the wiring in the midst of a terrible thunderstorm in a plane running low on fuel.”

–District Superintendent, November 2020

In the last 20 years, research on teacher learning has increasingly conceptualized teacher expertise as contextual and situated in their ever-changing contexts (e.g., Borko, 2004; Horn, 2005). However, as a field, we still know little about the processes through which experienced teachers continue to learn to adapt their existing knowledge to novel situations. As described in Chapter 2, the COVID-19 pandemic dramatically changed the landscape of schooling in ways that necessitated reconceptualizations of practice; thus, this study offers a focused look at how one group of experienced mathematics teachers responded to a similar set of shifting circumstances and uncertainties as they were driven to better serve their students' needs.

My situative view of teacher learning (Horn & Garner, 2022; Horn & Kane, 2019) posits that, as teachers encounter new ideas, they negotiate their understandings of teaching with other meaning systems, rendering their contexts fundamental to any analysis of their learning (Horn & Garner, 2022). As Horn and Garner (2022) have explained, teacher knowledge is socially embedded, ambiguous, and contested. This relationship exists because, as others have argued, teacher learning is situated in institutional and historical contexts (Philip et al., 2019), leading teachers to improvise and respond to the unique needs, identities, and experiences of students, as well as the contextual particulars of school communities and subject matter (Philip, 2019). This

is especially the case with teachers seeking to enact responsive forms of instruction, which was the case for this study’s participants. The context-dependent nature of teaching practice was heightened by the crisis brought on by the pandemic. Since COVID-19 altered teaching contexts and changed students’ needs, it changed (and made inescapably salient) what teachers had to respond to.

As described in Chapter 1, I define ongoing teacher learning as the continual development of a teacher’s conception of good teaching, and I ground my understanding of good teaching as a function of institutional logics, teachers’ personal visions, and their teaching practices (see Figure 4.1). In Chapter 3, I highlighted how changing institutional visions contributed to teachers’ asserted agency within the authoring spaces of their new figured worlds. In particular, I analyzed and discussed the institutional and ethical commitments teachers drew on or negotiated during the duration of the study, providing insight into the interplay between teachers’ personal visions and institutional logics. In this chapter, I extend this work by identifying teachers’ adjustments to practice and related visions of good teaching, rounding out an analysis into the aforementioned tripartite conception of good teaching. Specifically, I examine the relationship between teachers’ visions of good teaching and their agency to recreate their practice (or not) as they organize themselves in the figured world of pandemic teaching.

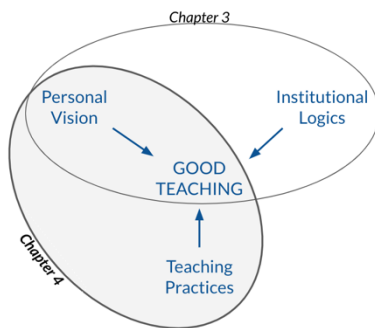


Figure 4.1: Visual Representation of Chapter Organization

4.1 Personal Vision: Teacher Identity and Salient Notions of Good Teaching

As in Chapter 3, I situate my analysis within Calabrese Barton and Tan's (2010) framework for the relationship between figured worlds, agency, and identity. I use a dynamic conception of teacher identity and view teacher identities as "reifying significant, endorsable stories about a person" (Sfard & Prusak, 2005, p. 14), capturing both the psychological/dispositional and sociological/situational aspects of who teachers are and how they are perceived. For instance, descriptions like *passionate teacher* or *apathetic teacher* reflect particular individual dispositions for teaching, while *immigrant teacher* or *alternatively certified teacher* reference broader social and cultural histories. Boundaries between individual dispositions and particular settings blur, as passionate teachers can become apathetic in unsupportive teaching situations (Santoro, 2011). Especially salient to teachers' identities are notions of "good teaching," which reflect both individual commitments and narratives that come from school and society (Chen et al. 2018; Horn et al., 2008; Kelchtermans et al., 2009). Notions of good teaching — whatever that means to teachers themselves, as well as whatever messages they receive — shape teachers' motivations to recreate their practice (Nolen et al., 2011).

4.2 Recreating Teaching Practices: Situational Adjustment and Commitment

To theorize teachers' recreation of practice within their figured worlds, I turn to Becker (1964), who explains this sort of change: "situations occur in institutions: stable institutions provide stable situations in which little change takes place. When the institutions themselves change, the situations they provide for their participants shift and necessitate the development of new patterns of belief and action" (p. 45). I view pandemic teaching as a moment where

institutions changed rapidly and dramatically, shifting teachers' situations and necessitating the development of new patterns of belief (rooted in their identities and notions of good teaching) and action (as they recreate their practice in agentic ways).

I align with Becker (1964) by casting an analytical lens on the effects of the social structure of experience by examining what he describes as the processes of *situational adjustment* as an explanation of change and *commitment* as an explanation of stability. Specifically, he defines situational adjustment as when “individuals take on the characteristics required by the situations they participate in” and commitment as when “externally unrelated interests of the person become linked in such a way as to constrain future behavior” (p. 41). Situational adjustments offer opportunities for growth, development, and learning, thus offering an explanation of change in unique circumstances (Becker, 1964). Importantly, Becker explains that people do not entirely reinvent practices when situations change. Instead, analysts can identify commitments that produce stability as professionals reject an array of situationally feasible alternatives and choose actions that best suit their purposes. In our case, teachers were required to draw on their existing identities and salient notions of good teaching as they made or rejected situationally feasible adjustments in the process of reorganizing themselves within their figured worlds of pandemic teaching. This chapter thus attempts to capture the relationship between teachers' identity and their recreation of practice in pursuit of responsive teaching practices.

4.3 Tinkering, Tipping Points, and Survival: Three Patterns of Responsiveness

To understand the relationship between teachers' visions of good teaching and their changes to practice, I analyzed teachers' interviews to understand their notions of good teaching

and their situational adjustments and commitments over time. As I developed portraits of each teacher’s conception of good teaching and summary of changes (see chapter 2), three patterns of responsiveness emerged. I have called them *tinkering*, *tipping points*, and *survival* (see Table 4.1).

Pattern	Case	Personal Visions of Good Teaching	Recreated (or Consistent) Teaching Practices	Pedagogical Adjustment or Commitment
Tinkering	Amber, Brad, Jasmine, Kirsten	Relying on experiences making changes to practice and feeling successful from in-person teaching	Adapted elements of their in-person teaching practices	Made incremental adjustments over time
	Jason	Providing opportunities for students to access content & following up to ensure they learned it	Switched computer science curriculum mid-way through the year	Made feasible situational adjustments in response to reaching a tipping point of students’ inability to access content
Tipping Points	Ezio	Fostering a supportive environment for perseverance through discovery-based learning	Adhered to paper/pencil in pre-pandemic teaching, but adopted Desmos as his primary online teaching method	Made feasible situational adjustments in response to reaching a tipping point of feeling ineffective
	Linda	Attending to students’ tactile and spatial reasoning to support their authentic engagement in mathematics	Performed in-person lessons on camera, consistent with in-person teaching	Held steadfast to pre-pandemic commitments without attempting to make situational adjustments
Survival	Kasey	Fostering students’ curiosity and love for mathematics by “meeting them where they’re at”	Reverted to pre-pandemic curriculum and modes of technology	Viewed situational adjustments as unfeasible despite a desire to make them

Table 4.1: Summary of Findings

In the remainder of this chapter, I will explore the relationship between teachers’ visions of good teaching and their agency to recreate their practice in the context of each of these three patterns. While I will give a brief overview of teachers exhibiting a Tinkering pattern by making

incremental changes to their practice over time, I will dedicate most of my analysis to the second two patterns. While the Tinkering pattern certainly contributes to our understanding of teacher change, the idea of incremental teacher change over time has already been well explored (e.g., Beatty, 2000; Schneider, 2014). Thus, the majority of this chapter will dive deeper into four comparative cases (Stake, 2013) — Jason, Ezio, Linda, and Kasey — of the other two patterns, Tipping Point and Survival, to better understand the conditions that may contribute to teachers’ abrupt situational adjustments or maintenance of existing practice to make meaning of their new figured worlds.

4.4 Pattern 1: Tinkering

Four of the eight teachers in this study adjusted their practice in response to pandemic teaching in ways that aligned with how teachers make changes in non-pandemic times – by tinkering with small elements of their teaching over time in a process of reflection and collaboration (Beatty, 2000; Huberman, 1995). It is important to note that the teachers in this study are highly reflective teachers who continually try to improve their practice even in “normal” contexts. For example, Brad explained, “If I was in-person, I would just be trying to improve my lessons and improve my design of the lessons” (*Interview 3, October 2020*). Thus, the process of seeking improvements to their teaching was a familiar one, and they drew on this habit as they sought adjustments to meet the demands of online teaching.

4.4.1 Personal Visions of Good Teaching

As teachers reflected on their practice throughout the year, they drew on prior understandings and existing visions of good teaching. Because participants were all experienced

teachers and leaders in their schools, they have a long experience of feeling successful in their in-person classrooms and drew on that to make adjustments to their pandemic teaching practices (Horn & Garner, 2022). For example, Amber described:

[The] things that I would do to elicit responses in person, I think I found the way to do that online. So, I don't know if it's the same, but if it wasn't feeling right, I knew that I needed to do something different. It wasn't feeling like how it was in person (*Interview 4, March 2020*).

In this excerpt, Amber explains how she relied on the feelings she had experienced in person to cue her to “do something different” — or make small adjustments — to her practice. Similarly, Kirsten drew on her experiences designing productive learning activities as she made adjustments to her practice. In her explanation of why she changed her lessons and assessments to better meet the demands of online teaching, she stated:

If I feel that I'm going to do a lesson that is just me talking and giving them notes to do, I don't find that very productive [...]. Same thing with assessments. [...] If I don't have in my mind that this assessment is going to be productive for them along the way, then we don't want to waste any time (*Interview 4, March 2020*).

As Kirsten reflected on her teaching practices, she drew on a specific vision of good teaching — productiveness — to drive adjustments she made to her teaching. The other Tinkering teachers expressed similar sentiments of relying on prior feelings of success as cues to make adjustments and drawing on their visions of good teaching, which emphasized productivity and efficiency in making decisions about teaching practices.

4.4.2 Situational Adjustments

Tinkering teachers made incremental adjustments in two ways. First, they described making minor adaptations of elements of their in-person teaching to fit the demands of online teaching. As Brad explained, “I'd used Desmos plenty in-person, so I just stuck with it. And so, I'm going to continue sticking with it” (*Interview 3, November 2020*). Along the same lines, Amber described “feeling really good at Google apps” because she was “pretty savvy [with them] before [the pandemic]” (*Interview 3, October 2020*).

By contrast, Jasmine described making adjustments by finding ways to design her students' learning that differed from in-person:

I'm not going out of my mind trying to figure out, "How do I let them work in groups?", or, "How do I do this?", because I would've normally done this in class. Sometimes it's just not possible, and so maybe I can find alternate ways and try that (*Interview 3, October 2020*).

In this excerpt, Jasmine likens making adjustments to finding “alternate ways” to foster the same student engagement, such as working in groups. By adapting elements of in-person teaching and finding different ways to achieve the same goals for student engagement that they had in person, Tinkering teachers made small but intentional decisions about modifying their practice; they made incremental adjustments over time through a process of continual reflection and change.

As these teachers tinkered, they experienced more and more success. For example, Amber explained, “I do feel like there is a vibe of, ‘We're jiving. We're discussing. We're actually getting stuff. We're getting somewhere,’ hopefully because of the things that I've been doing and the ways that I've been changing it up” (*Interview 4, March 2020*). Similarly, Brad described feeling “really confident and comfortable” (*Interview 3, October 2020*) with his online

teaching. Furthermore, Jasmine explained that she still felt like she was growing as a teacher: “I have realized my lessons have gotten better over technology [...] I'm growing in terms of the technology aspect. Just because I can't do what I did before doesn't mean that I'm regressing” (*Interview 3, October 2020*). As teachers tinkered with their practice, they were given signs of success in the form of feeling productive, comfortable, and like they were growing as teachers.

In sum, the tinkering teachers used their experience and reflective habits to carry on with a common pattern of incremental change. The four teachers that exhibited the tinkering pattern relied on prior feelings of effectiveness and visions of good teaching that encompassed efficiency and productivity as cues to make adjustments to their practice. These adjustments were often in the form of making minor adaptations to their in-person teaching practices or finding different ways to achieve their pre-pandemic teaching styles. They were rewarded for making such adjustments by feeling successful and experiencing professional growth.

4.5 Pattern 2: Tipping Points

The next pattern of situational adjustment was exhibited by the two teachers who experienced a distinct moment that pushed them to dramatically revise their practice, which I call the tipping point. Returning to Becker's (1964) notion of *situational adjustment*, we see that it can explain situations in which the person “has a strong desire to continue, the ability to assess accurately what is required, and can deliver the required performance, the individual turns himself into the kind of person the situation demands” (p. 44). In this section, I explore the cases of Jason Schulte and Ezio Martín, who both described reaching a tipping point that forced them to seek out situational adjustments. For each case, I describe the teacher's salient vision of good

teaching, the tipping point the teacher reached, and the subsequent situational adjustment they made.

4.5.1 Jason Schulte: Adjusting the Curriculum in Response to Student Grades

Jason's vision of good teaching involved providing opportunities for students to access mathematical content and following up to ensure they developed solid mathematical understanding. Midway through the pandemic teaching year, he reached a tipping point where he felt unsuccessful at providing students with such opportunities, prompting him to switch his curriculum to one that he deemed more accessible.

4.5.1.1 Background and Context

Jason was the math department lead and the Athletic Director at Clarence Stephens High School, a public charter school that serves a population made up of 100% Latinx students. In his role as Athletic Director, Jason saw most of the students at his school in a non-academic capacity before he had them as students, contributing to a friendly rapport he was able to develop with most of the students in his classes. He also sat on the board of managers for his school, which allows him to give his input into matters such as the curriculum and scope and sequence of the math classes, class schedules, and budget distribution. Because of his leadership role within the school, Jason often picks up extra classes resulting from teacher vacancies. As such, he frequently teaches both Advanced Placement (AP) computer science classes filled with the school's most ambitious STEM students and typically reserved for experienced and tenured teachers like himself, as well as remedial algebra classes that serve students who have struggled with math in their schooling, giving him unique insight into the needs of the student population.

4.5.1.2 Personal Vision of Good Teaching: Making Mathematics Accessible and Engaging

When Jason was prompted to describe what it meant to be a good teacher, he responded with three things:

The first is providing the opportunity for your students to learn the material. And the second one that goes along with that is, making the material engaging for the students.

Making them want to learn the material. And then the third one is getting or following up with and making sure the students are doing the work and learning the material (*Interview 3, October 2020*).

Throughout this study, Jason was unwavering in this vision of good teaching. Additionally, it is clear from his comments that his vision of good teaching remained aspirational. After offering this description, he evaluates himself as “not a good math teacher.” In Interview 5, he elaborates, “I would put myself somewhere in the middle. I'm somewhere around average [...] because I just don't find ways to make [the math] interesting for them” (*Interview 5, June 2021*) despite his efforts to do so. As the pandemic year went on, Jason drew on his vision of good teaching and feelings of failure in important ways.

4.5.1.3 Tipping Point: Reaching a Critical Mass of Misunderstanding

At the beginning of the 2020-2021 school year, Jason taught his AP computer science classes from a curriculum — Edhesive — that he had used during in-person teaching. During the first semester, he worked through Edhesive as he had done before the pandemic. Then, in the first interview of 2021, he described a “tipping point” where he realized that the curriculum was not working as he had intended:

The tipping point for me was I gave them a final project for their final exam grade last semester [...] And I [graded] the first six, which is probably about 10 to 15% of my

students, not a single one of them would have gotten above a four or a five [out of 6].

And what that told me was I missed the boat in explaining some of this stuff. It's not like one or two kids aren't understanding this, it's like the class isn't understanding (*Interview 4, March 2021*).

In this excerpt, Jason draws on one element of his vision of good teaching — “following up with and making sure the students are learning the material” — by explaining how he used the end-of-semester project as a proxy for student learning. Important to this analysis, Jason attributed his students’ failure on the project to his inability to “explain some of this stuff,” putting the onus on himself to adjust instead of on the students.

As Jason reflected on Edhesive in light of this tipping point, he drew on another aspect of his conception of good teaching: providing opportunities for students to learn the material. He determined that students were unable to grasp the major conceptual ideas of computer science from the Edhesive curriculum:

It didn't seem that the students were able to access the content ... it didn't seem like the majority of students were able to access the content using Edhesive [...] It seemed like a number of the students were just really struggling to kind of understand what the program wanted them to do. I didn't feel that my students were understanding the concepts of the programming that they were doing (*Interview 4, March 2021*)

By reaching a tipping point prompted by his students’ failing grades, Jason recognized that Edhesive was not serving two major aspects of his vision of good teaching, causing him to seek out feasible situational adjustments.

4.5.1.4 Situational Adjustment: Switching Curriculum

Although Jason had used Edhesive during in-person teaching, he determined that the new demands of online teaching limited its success: “I just felt like a lot of the kids were pretty lost on it and difficult to try to get them back in distance learning, not being able to sit down with them and go over things” (*Interview 4, March 2021*). As such, he switched to two different open-source computer science curricula that had better reputations of success during online teaching. The open-source nature and strong reputation of these new curricula contributed to Jason’s understanding of the adjustments as feasible. Jason recognized that making this adjustment to practice had its downfalls, like being time-consuming:

I decided that we would instead go over the programming stuff again but in Code.org now to get kind of a different perspective on it, and then we'll do the create performance task after that, so maybe this different perspective is helping them get a little bit better understanding of the topics and that sort of thing [...] It's a lot of extra time that if we had started with Code.org from the beginning, we would have avoided all of this (*Interview 4, March 2021*).

Importantly, Jason determined that the downsides of switching curricula midyear were worth it, because the adjustments helped his students to better access the content, thus making him feel like a good (or at least better) teacher.

In sum, Jason held a strong vision of good teaching that was threatened when his students failed to grasp the computer science concepts he felt obligated to teach. He experienced their challenges in mastering the content as a tipping point, spurring him to select new curricula that better fit the demands of online teaching. In other words, Jason made feasible situational

adjustments in response to feeling like he was not achieving the core elements of his vision of good teaching.

4.5.2 Ezio Martín: Adjusted Relationship to Technology in Response to Ineffectiveness

Ezio's vision of good teaching was rooted in fostering a supportive environment for perseverance through discovery-based learning. While he initially resorted to traditional, lecture-based teaching online, he eventually reached a tipping point where he felt unsuccessful at providing student-centered experiences. He ultimately adjusted his practice to incorporate new technology that better aligned with his conception of good teaching.

4.5.2.1 Background and Context

Ezio was an eighth-grade math teacher with over 20 years of experience. Throughout his career, he has only taught at two schools, and most recently, Mina Rees Middle School, a magnet school with a STEAM (science, technology, engineering, art, and mathematics) focus. Both before and during online teaching, Ezio taught a block schedule in which classes met every other day with longer classes. With the onset of remote schooling, the administration introduced an advisory period during which teachers were expected to facilitate family communication and social and emotional supports for students. This felt new to Ezio, as he frequently described social and emotional learning as something that was not connected to his teaching practice and identity. While over half of the students at Rees were from the surrounding neighborhood, there were still many students who were bussed in from across the city. When the district initiated remote schooling and distributed the necessary technology via pick-up at the school, Ezio expressed uncertainty about the plan, stating his concern that students outside of the neighborhood might not have access to these resources.

4.5.2.2 Personal Vision of Good Teaching: Supporting Students' Perseverance

Ezio saw himself as a mathematician whose role was to expose students to authentic ways of doing math and being mathematical, and this mathematical identity shaped his teaching identity. He holds multiple degrees in mathematics and often drew on his own experience and identity as a mathematician in this teaching practice. For example, he was intentional about exposing his students to rich and complex mathematical tasks (Buenrostro & Ehrenfeld, 2022), as well as supporting them to develop a growth mindset and perseverance. He felt a responsibility to foster a supportive environment for perseverance through discovery-based learning; when he reflected on how he has grown as a teacher throughout his career, he described a gradual shift “to making [my classroom] a more student-centered classroom where I was more facilitating and not being the sole authority” (*Interview 3, November 2020*). This shift to centering students’ mathematical authority and agency was connected to his commitment to teaching *well* as a way to prepare students for what they will do next. Similarly, the nature of Ezio’s feedback during in-person teaching reflected his commitment to discovery-based learning, as he typically asked questions to explore students’ current understandings in pursuit of fostering perseverance: “[My] way of giving them feedback was asking them questions and trying to lead them to see what was going on, rather than just say, ‘Hey, check the third step.’” By supporting students’ mathematical exploration and autonomy through probing questions, Ezio hoped to teach not only mathematical content but also mathematical habits of mind (Cuoco et al., 2010).

4.5.2.3 Tipping Point: Recognizing Ineffectiveness

At the start of online teaching, Ezio initially tried to fall back on a traditional, more comfortable style of mathematics instruction by recording in-person lectures, during which he wrote mathematical concepts on a whiteboard at home, instead of learning new technologies:

“This virtual world is new to me, so it was just safer. [I thought,] ‘Just stick with what you do. Go ahead, lecture the whole time, lecture the whole hour’” (*Interview 3, November 2020*).

However, like Jason, Ezio reached a tipping point when he recognized that maintaining this approach to teaching limited his ability to adapt to online learning in a way that made him feel successful:

It wasn’t effective, but I guess as the days or weeks wore on, then it started getting to me.

[I thought,] “Okay, this isn’t working. You’re not doing your job, you’re just lying to yourself when you’re doing that” (*Interview 3, November 2020*).

In this excerpt, Ezio describes an inner dialogue about not living up to his own standards of teaching. In particular, he describes *not doing his job* and *lying to himself*, signifying a disconnect between his actions and his pedagogical responsibilities.

Ezio felt particularly unsuccessful in the ways online teaching did not meet his expectations rooted in his value of discovery-based learning – he did not feel like he was meeting the needs of his students or the demands of online teaching. As one example, Ezio noted that by recording lecture-style videos and avoiding new technologies, his feedback to students changed: “Now the little feedback I give I have to be explicit about whatever’s wrong, instead of them figuring it out on their own, so my feedback is really poor now, or not the way I want it to be” (*Interview 2, August 2020*). Instead of supporting students’ sensemaking and autonomy, as he had learned to do in the classroom, he had regressed to mere corrections of their work.

4.5.2.4 Situational Adjustment: Learning a New Technology

Dissatisfied with his teaching, Ezio knew something needed to give. In an attempt to feel more successful, Ezio spent an entire weekend in the Fall of 2020 learning how to utilize

Desmos Classroom, an online lesson-building tool⁴. He explained that he gravitated toward Desmos after a colleague “did a Desmos for Dummies session with me, and she just walked me through everything,” resulting in him “using Desmos a lot more in my classroom” (*Interview 3, November 2020*). The nature of the technology enabled Ezio to feel like a good online teacher in ways he had not felt in online teaching before adopting it. For example, he felt that he could now give students meaningful feedback grounded in their mathematical understanding: “I’m still talking too much, but at least there’s more feedback now that wasn’t happening before Desmos” (*Interview 3, November 2020*).

Once Ezio adjusted his practice to embrace this new technology, he found that he was able to more easily maintain other pedagogical commitments, such as building relationships with students through humor in a virtual setting. In an interview, he explained,

Virtually, I started off not knowing these kids yet, and one thing I was scared of is how is my humor going to translate virtually? But apparently, the kids like my humor or they’re getting it, they’re getting it, they’re playing along with it, and I didn’t think it was going to translate that well virtually. So, I don’t know, the kids seem to enjoy the class, so I think Desmos changed everything (*Interview 3, November 2020*).

In sum, after attempting to maintain his pre-pandemic teaching identity as a “traditional mathematician” who did not use technology, Ezio developed new understandings of the demands of online teaching and modified his approach to teaching to meet those demands. Namely, he buckled down to learn new technology when he realized that online teaching was making him feel unproductive. For example, he said, “I’m using Desmos a lot more in my classroom... I just

⁴ Desmos Classroom is a free technology that hosts digital classroom activities designed for students to “explore [math] concepts more deeply, collaborate with their peers on problem-solving, and apply knowledge creatively as mathematicians” (Desmos.com). Teachers can also develop their own classroom activities catered to their specific students and content while utilizing the tools built into Desmos for student exploration and collaboration.

feel more productive now. I have something to build from. Not that I'm doing everything perfect in Desmos, but I'm learning as I go along" (*Interview 3, November 2020*). Furthermore, this shift in practice allowed Ezio to tap into other commitments, like showing care for students through humor.

4.6 Pattern 3: Survival

The final pattern of situational adjustment was exhibited by the last two teachers in the study who, for different reasons, chose not to substantially adjust their practice. I call this pattern *survival*. Again, to understand this pattern, I return to Becker (1964), who explains that a person is *committed* when they pursue a consistent line of activity in a sequence of varied situations.

Important to understanding this final pattern is Becker's description of commitment:

It is a distinguishing mark of commitment that the actor rejects other situationally feasible alternatives, choosing from among the available courses of action that which best suits his purpose. In doing so, he often ignores the principle of situational adjustment, pursuing his consistent line of activity in the face of a short-term loss. (p. 50)

To look at survival, I explore the cases of Linda Simmons and Kasey Zimmerman, who ultimately accepted a short-term loss as they maintained core elements of their pre-pandemic teaching practice. In Linda's case, maintaining her practice allowed her to hold on to her notions of good teaching, and in Kasey's case, he maintained his practice even though he recognized the ways it did not fulfill his vision of good teaching. For these teachers, teaching during the pandemic was a story of survival; they needed to hold on until they could return in person by whatever means necessary. For each case, and in alignment with Becker's distinguishing mark of commitment, I describe the teacher's salient vision of good teaching, their response to

situationally feasible adjustments, the consistent line of activity they pursued, and the short-term loss they experienced.

4.6.1 Linda Simmons: Held Steadfast to Commitments

I view Linda as committed in the sense that Becker describes because she pursued a consistent line of activity — recreating in-person lessons — throughout the year. She often rejected situationally feasible alternatives, such as learning to use Desmos or other technologies that might be well-suited for online teaching. Instead, she chose to plan lessons as if she were in person to best fit a particularly salient element of her conception of good teaching, even in the face of a short-term loss, which, for her as an award-winning teacher, was feeling unsuccessful.

4.6.1.1 Background and Context

Linda was a veteran teacher of over 20 years. A second-career teacher, Linda entered teaching in response to STEM teacher shortages, motivated by her love of mathematics, which strongly shapes her teaching identity: “I wouldn't be a teacher if I didn't get to teach math. I love math. Right? I love teaching, but I love teaching math” (*Interview 1, May 2020*). At the time of our study, Linda had been teaching Geometry at her current school, Fern Hunt High School for five years; prior to that, she had taught middle school for over ten years. Importantly, she volunteered to only teach Geometry, telling me, “I’m the only person at my school who [Geometry] is their favorite thing, so I teach straight Geometry” (*Interview 1, May 2020*). Additionally, Linda had taught university courses for pre-service teachers in between these two school placements.

Linda’s long career was characterized by continued professional growth. In addition to several years of membership in the PDO, she held leadership roles within several mathematical

teaching organizations and frequently attended and presented at national mathematical teaching conferences. She was a National Board Certified Teacher known in her professional communities for possessing impressive expertise in teaching, and she often talked about continuing to learn and grow her practice.

Linda was acutely attuned to the student population at Fern Hunt High School. While all of the focal teachers expressed concerns about whether students had adequate technology and internet access, Linda also described a “significant” homeless population within her school’s student body, adding students’ families’ income and housing security to her list of pandemic schooling worries.

4.6.1.2 Personal Vision of Good Teaching: Embodied and Experiential

Linda’s personal vision of good teaching was wrapped up in her love for Geometry; she felt a pedagogical responsibility to students’ physical, embodied, and experiential mathematical learning. Geometry was her favorite subject to teach because of its tactile characteristics and she often discussed how the physical space of her classroom contributed to her commitment to care for her students as well as fostering their collaboration and rich mathematical engagement, like in this description of her classroom: “I have built a very intentional learning space that has particular things on the walls. It has a particular arrangement of the tables” (*Interview 3, November 2020*). She also often referenced the importance of materials in her teaching, like when she said, “I teach very driven by the stuff on the table kind of thing” (*Interview 2, August 2020*), in a reference to yardsticks, string, scissors, and other physical materials she typically had available on student desks. Her commitment to the physical resources in her classroom was rooted in her pedagogical responsibility to attend to students’ tactile and spatial reasoning to support their authentic engagement in mathematics, especially Geometry.

4.6.1.3 Response to Situationally Feasible Adjustments: Resisting Multiple New Technologies

In our interviews, Linda frequently framed potential situational adjustment as not worthwhile. For example, she expressed a lack of desire to invest time in learning new technologies: “I just don’t care that much about [technology] to invest umpteen oodles and oodles in learning like every new widget, whatever” (*Interview 3, November 2020*). Similarly, when she discussed pre-recording lesson videos (a technique used by other teachers at her school to free up their time with students for conferencing and individualized support), Linda said:

I really sort of just decided I'm not making videos. And it's interesting to listen to the teachers at my school who are still really, really committed to the idea of, oh, I'm going to tape myself and I'm going to do all this sort of stuff (*Interview 2, August 2020*).

Here, Linda contrasts her response with those of her colleagues, who arrived at a common way to recreate instruction in the world of pandemic teaching. Her admissions of “not caring that much” about learning new technologies and “just deciding” to not make videos show that her actions were a deliberate choice.

While Linda resisted some situationally feasible adjustments, she did make some changes to her practice. She described “getting good” at using Microsoft PowerPoint to organize her time in front of students and Schoology, a platform for students to submit assignments and to grade them, to organize her assignments and grading. Important to this analysis is how Linda described these changes as not contributing to her notion of being a good teacher: “I don't think putting up something online is going to be contributing the essential pieces of what it means to teach” (*Interview 2, August 2020*). In a later interview, she elaborates by reiterating the idea that adapting PowerPoint and Schoology into her practice is not valuable to her conception of teaching:

Maybe the problem is the things I'm getting better at are things that I don't value because I see them as superfluous and not actually serving teaching. I think they're serving this horrible absurdity that we're living in and so I think, "Anything that I'm learning, just discount" because I write it off as being part of the bizarro world (*Interview 3, November 2020*).

In sum, Linda actively resisted situationally feasible adjustments that other teachers made, and she understood the adjustments she did make as not valuable to her long-term practice.

4.6.1.4 Consistent Line of Activity: Recreating In-Person Lessons

Instead of making situationally feasible adjustments, Linda maintained her commitment to attending to students' tactile and spatial reasoning by performing her lessons on camera as she had in person for her students. In interviews, she spoke of adherence to physical lessons to teach complicated mathematical concepts: "the idea of having this co-constructed, giant thing that we do in person, right? ... I don't want to let go of it entirely because [trigonometry] is confusing" (*Interview 3, November 2020*). This adherence was evident throughout the study when Linda continually described how she recreated in-person lessons. For example, she talked about using action figures on camera to represent student bodies for a lesson that tapped into students' embodied understanding of graphing on a coordinate plane. In these ways, Linda consistently pursued ways to recreate her in-person lessons in a variety of situations throughout the year.

4.6.1.5 Short Term Loss: Feeling Less Successful than In-Person Teaching

As described above, Linda consistently maintained her pre-pandemic commitments to physical materials, at times openly rejecting technological adjustments called for by the virtual teaching experience. She recognized this limitation, making frequent comments such as, "This doesn't feel like a year where I'm getting better at anything" (*Interview 3, November 2020*), or

“I’m not proud of who I am as a teacher right now” (*Interview 3, November 2020*). She even described specific elements of teaching that she felt were affected by her adherence to pre-pandemic practices. For instance, she described continuing a practice of grading by annotating student work as she did in person: “It’s a losing battle. And the amount of return I get on investment for it is just- I’m not happy with it. So, I hate my grading this year. I absolutely hate it” (*Interview 3, November 2020*).

Linda accepted a short-term loss of feeling less success in her job, a sentiment that she expressed when comparing her pandemic teaching self to her BCE self:

I feel now that I know this is not me at my best, I know this is not– the Linda in the little box [*referring to the computer screen*] is not as good as Linda in person... I’ve never felt so incredibly inadequate and, I don’t know that I would go so far as to say a fraud, but certainly so far from who I want to be as a teacher (*Interview 3, November 2020*).

Further exacerbating this loss, Linda felt that her students were not learning in the ways they had learned during pre-pandemic teaching, because she was unable to draw on the physical resources and culture of her classroom. For example, she told me, “I’m realizing how much they’re not learning because they’re not marinating in the environment” (*Interview 3, November 2020*).

In sum, Linda’s notions of good teaching were strongly tethered to her classroom space and physical materials, so much so that it drove her to exclusively teach Geometry because of its tactile characteristics. Online teaching presented unique challenges to Geometry teachers like Linda that relied on manipulatives and other tangible tools that could not be exactly replicated by computer-based substitutes. As such, she rejected situationally feasible adjustments called for by the virtual teaching experience. She pursued a consistent line of activity by performing her in-person lessons on camera, even in the face of feeling inadequate.

I do not present Linda's case as one of a complacent veteran teacher who was too set in her ways to take up new technology. Instead, Linda's pursuit of survival during a time of great disruption offers insight into the limits a passionate and open-minded teacher may reach when changing their practice threatens their personal visions of good teaching.

4.6.2 Kasey Zimmerman: Remained Committed Despite Desire to Adjust

Kasey also remained committed because he pursued a consistent line of activity — namely, teaching from a curriculum that did not translate well to remote learning and resisting Desmos. He differed from Linda in that he initially attempted to pursue situational feasible adjustments. However, he ultimately rejected them, resulting in short-term feelings of failure.

4.6.2.1 Background and Context

At the time of this study, Kasey had been teaching for almost 20 years, most recently at Dorothy Johnson Vaughan School, a public charter school for the arts. Due to its arts-focused curriculum and culture, students traveled from over 80 cities to attend Dorothy Johnson Vaughan School, contributing to a diverse student population relative to the other schools in this study. Kasey comes from a family of educators and considers himself an educator for life, admitting that he doesn't "want to ever retire." His commitment to his career is reflected in his commitment to his school; he was employed by the school before it opened to students, and he played an integral role in building the school's core philosophy, hiring staff, developing the mathematics program, and selecting its curriculum.

Kasey's teaching practice was characterized by constant reflection, a quality that he described as his "superpower" and what "makes [him] a quality teacher." A father of two school-

aged children, Kasey often reflected on his children’s schooling experiences — particularly when they were learning from home during the pandemic — to inform his teaching.

4.6.2.2 Personal Vision of Good Teaching: Building Students’ Love for Mathematics

Kasey’s notions of good teaching were rooted in fostering his students’ curiosity – mathematical or otherwise, as he described in Interview 2:

My goal is that they understand that we're creating a space and a place that despite all the distractions where they can go to learn and be curious [...] I think if we were in person, I'd sprinkle a little bit more math in there but at the beginning of the year my goal is always the non-math stuff (*Interview 2, August 2020*).

He likens creating a space for students to be curious to “helping them see the beauty in math” and moving students’ feelings about math “in a more positive direction.” He often discussed good teaching in the context of “meeting students where they were at” – both in terms of their mathematical abilities and love (or dislike) of math – and working toward mathematical understanding and positive feelings toward math from the students’ current mindsets.

4.6.2.3 Response to Situationally Feasible Adjustments: Attempting to Change Practice

In interviews, Kasey described two different attempts to adjust his practice to meet the demands of online teaching. First, he explained that the math department at his school had decided to switch “from a curriculum I really loved” (*Interview 2, August 2020*) to the Illustrative Mathematics Curriculum because of its more natural integration with technology. Despite feeling less comfortable with the new curriculum, Kasey initially aligned himself with the department and taught Illustrative Mathematics.

Second, Kasey expressed an interest in learning Desmos to help foster student engagement:

To be honest, I think [Desmos is] what I should be doing. I think that would solve a lot of the concerns that I have about how to engage students. I started watching a webinar before school started about *Desmos Lessons 101*. I got 20 minutes in, and I just never finished the video. I think if I can find time to do that, the students would like it. I feel like that would solve a lot of my problems with the students who don't want to engage. I feel like if they were on Desmos, they could engage without the fear of “everybody is looking at me” or “everybody is looking at what I'm saying.” I can see who is doing stuff. Who is participating, who's not, who's struggling, who's not. I need to do it [...] Doing that Desmos stuff would benefit me and my students more than pretty much anything, which of course means I should do it (*Interview 3, October 2020*).

In this excerpt, Kasey describes the features of Desmos he found valuable in relation to his vision of good teaching, particularly his desire to meet students at their current mathematical understanding. In fact, as we talked during this interview, Kasey drafted an email to the leaders of the professional development organization requesting support in learning how to use Desmos, claiming that he felt “really guilty” for not doing it earlier.

4.6.2.4 Consistent Line of Activity: Reverting to Old Teaching Practices to Self-Preserve

As the year went on, Kasey's mental and physical capacity to make adjustments waned as pandemic life wore him down in numerous ways. Instead of maintaining or extending the adjustments he started with, he reverted to using his old curriculum and gave up trying to learn Desmos. As Kasey described it to me, “I'm staying up until 1:00. Every night it's all the teaching and then so much time spent planning, emailing, administrative tasks, it's so much stuff that we have to do” (*Interview 2, August 2020*). This workload took a toll on his mental health:

Because we're at such deficits on free time and mental health and the other side of being a human being and surviving, being a father, being a husband, whenever we do have free time, that's where it goes and that's where it needs to go [...] That analogy of just trying to keep your head above water is such a perfect analogy, because I just always feel like my chin is below water but my nostrils are above water (*Interview 3, October 2020*).

To decrease his workload, Kasey started teaching from his old curriculum instead of Illustrative Mathematics, as the department had agreed on, a change he estimated decreased the amount of time he spent on schoolwork by 30%. He also recognized his shortcomings when it came to technology, saying, “I feel like I'm pretty good with technology, but I think that I'm also really resistant to trying new technologies and my capacity to learn them” (*Interview 3, October 2020*).

As a result, he stopped pursuing incorporating Desmos:

I've now gone from hope to find time to utilize Desmos better, to resigned that there is not time to utilize Desmos better. Actually, I'll be honest, even if I had more time, I don't have the capacity to just create more (*Interview 4, March 2021*).

4.6.2.5 Short Term Loss: Doing a Poor Job At Teaching

Important to Becker's (1964) framework of *committed*, Kasey pursued his old curriculum and gave up on learning Desmos in the face of a short-term loss, namely, being a bad teacher temporarily. When reflecting on his online teaching year, Kasey explained:

I was really bad at [teaching]. I just felt like I did a really poor job, I didn't feel like I was teaching. I didn't feel like I was using the tools that other people were using. But, at the same time, I did the best I could, it was just a really bad job. I just didn't have the bandwidth to make the investment to use Desmos lessons the way that I feel like I should have. So, I don't feel bad about that. I know that it would have been better if I invested

more in Desmos, but I just didn't have the bandwidth. It's weird because I feel like I feel bad about a lot of things, but I don't feel bad about how bad of a teaching job I did because I was doing the best I could, and I just couldn't. I needed more support in order to make it there, and even if we had it, I was just so done every day (*Interview 5, June 2021*).

Kasey made peace with this loss, as evidenced in his admission of not feeling bad about it. Furthermore, he offered a reason for this acceptance: namely, his survival. He explained, “Now in a pandemic, it's just like, ‘Well, now we've just got more weights dragging us down,’ but it's still that feeling of trying to keep your head above water. I'm just trying to get to the next day.”

In sum, Kasey's vision of good teaching involved fostering students' curiosity and love for mathematics by identifying their current understandings and mindsets as the primary drivers of instruction. While situational adjustments to his practice (such as using the Illustrative Mathematics curriculum or adopting Desmos) would have served this notion of good teaching, and he expressed a desire to do so, he ultimately did not find them feasible, resulting in a short-term loss.

4.7 Discussion

In this chapter, I explored the relationship between teachers' visions of good teaching and their agency to recreate their practice as they organized themselves in their figured worlds of online teaching. By casting an analytic lens on teachers' situational adjustments and commitments, I aimed to shed light on the conditions that prompted the study teachers to pursue self-directed change.

The teachers in the first pattern, tinkering, reflected a common and well-documented way for teachers to change their practice. Namely, the experienced and reflective teachers made incremental changes to their instruction over time in pursuit of their visions of good teaching. Although the ways the tinkering teachers recreated their practice during pandemic teaching did not offer groundbreaking insights, their talk about their practice and their descriptions of the adjustments they made offers a useful contrast to the teachers in the other two patterns.

For Jason and Ezio, a tipping point pushed them to dramatically revise their practice, offering insight into the cues teachers tune into when self-evaluating their effectiveness. Jason looked to student understanding to determine that he needed to teach in a different way and Ezio turned to his feelings of ineffectiveness to spur a change in practice. Importantly, both Jason and Ezio drew from strong visions of good teaching to direct their responses to their respective tipping points. Jason felt a responsibility to make sure his students were learning the material he presented, allowing him to take ownership of student misunderstanding and seek out an alternative curriculum. Ezio valued discovery-based learning and got fed up with his own practice when he realized he was not offering students the opportunity to engage in authentic mathematical exploration.

While both Linda and Kasey exhibited a survival response, their cases highlight the vastly different reasons teachers may have for exhibiting what is ostensibly the same behavior. At the surface, Linda and Kasey both held fast to their teaching commitments, choosing not to recreate their practice, despite experiencing feelings of professional failure. However, Linda remained unwavering in her conception of good teaching rooted in the physical space of the classroom, which ultimately resulted in her rejection of pandemic-appropriate adjustments to practice. Kasey, in contrast, initially sought out adjustments to better align with his notion of

good teaching as fostering student-driven curiosity for mathematics, but he felt that the situational demands were too much for such adjustments to be feasible.

4.7.1 Changing Curriculum to Meet the Needs of Online Learning

Interestingly, both Jason and Kasey changed their curriculum to one that better met the demands of online teaching. While Jason was able to find success with the new, remote-learning-friendly Code.org, Kasey found learning a new curriculum during a pandemic to be overwhelming, and he ultimately resorted back to his original curriculum to lessen the demands on his mental health. The contrasts between these cases are important for researchers and practitioners to attend to. While a deep dive into Jason's and Kasey's different outcomes in switching curricula is beyond the scope of this chapter, at the very least, this analysis suggests that teachers' personal and professional contexts give them a very different capacity for changing their practice.

4.7.2 Feeling Ineffective in Online Teaching

Another interesting contrast emerges when we consider Ezio and Linda, who both described feeling ineffective as teachers during pandemic teaching. Ezio reached a tipping point and made a novel adjustment to his practice (incorporating Desmos into his instruction), while Linda kicked into survival mode, accepting her feelings of ineffectiveness as a short-term loss. This analysis points to the ways their individual visions of good teaching may have contributed to these differences. That is, because Ezio's vision of good teaching centered discovery-based learning, he viewed the adjustments he made to his practice (specifically, utilizing the exploration and collaboration tools built into Desmos Classroom) as converging with his vision.

In contrast, Linda's vision of good teaching centered on spatial and material aspects of her lessons, leading her to view technological adjustments as diverging from her vision.

4.7.3 Pushing Back on Narratives of Teacher Resistance to Instructional Change

This examination of three patterns of responsiveness — tinkering, tipping points, and survival — contributes to our understanding of ongoing teacher learning by offering a framework with which to understand teacher change or perceived resistance to it. As an extension of Chapter 3, this analysis deepens our understanding of the possibilities of teachers' agentically recreating their practice as institutional barriers were stripped away. Overall, this chapter makes the case for attending to teachers' identities and existing visions of good teaching if we seek to understand the catalysts and barriers to teacher change.

CHAPTER 5

A Typology of Adaptive Teaching Practices

“To be honest, I feel like I’m such a different person now, compared to pre-COVID.”

–Jasmine Lin, high school mathematics teacher, November 2022

In research, policy, and public discourse, teacher learning is often treated as a technical issue that can be addressed with standardized techniques (Gutiérrez, 2008). In Chapter 1, I argue that this approach to teacher learning limits our analysis and proposed solutions for issues that arise that require teachers to develop new skills, whether at the federal, state, district, school, or even classroom level. Instead, recasting teacher learning as a wicked problem (Rittel & Webber, 1973) creates opportunities to explore how teachers could be supported to construct and reconstruct their ideas of good teaching over time in a process of ongoing learning as they adapt to new students, situations, local contexts, or institutional demands. Thus far, this dissertation has focused on the drastic and sudden shift in teaching contexts and institutional demands that teachers experienced in response to the COVID-19 pandemic. Yet, the story of these teachers would be incomplete without an exploration into the ways they pursued good teaching after the dust settled and they returned to their classrooms once vaccines and other mitigation measures were in place. Therefore, in this chapter, I investigate research question 3 (RQ3) — *After the initial crisis of online teaching, how did the focal teachers’ pandemic teaching experiences influence their instructional practice?*

To examine this question, I extend my critique of the good teaching literature described in Chapter 1 and offer an alternative framework for understanding the relationship between good

teaching and teaching practices. I maintain that good teaching is a function of institutional logics, teachers' personal visions, and teaching practices, and I recognize that teachers' conceptions of good teaching may look different across different contexts (see Figure 5.1). In this sense, teacher learning can be understood by examining the ways teachers respond to changes in their environment and adapt their teaching practices over time. In Chapter 3, I discussed the pedagogical responsibilities teachers drew on or negotiated during the duration of the study, providing insight into the interplay between teachers' personal visions and institutional logics. In Chapter 4, I identified teachers' adjustments to practice and related visions of good teaching. In this chapter, I build off the findings from Chapter 4, highlighting teachers' sustained changes in practice over time while attending to the organizational, institutional, and situational contributions to such changes.

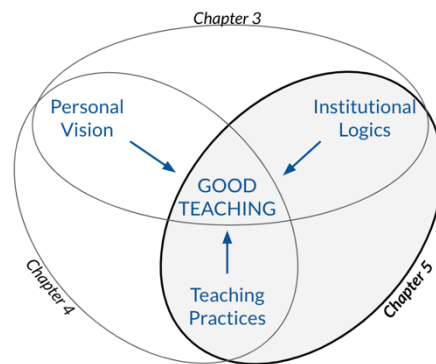


Figure 5.1: Visual Representation of Chapter Organization

5.1 Responsive versus Adaptive Teaching Practices

As in Chapter 4, I draw from Horn et al.'s (in press) conception of *responsive teaching practices*, or “those driven by the needs, experiences, identities, and learning of particular students in particular subject areas in particular moments in particular settings, rather than being driven by adherence to universal ‘best practices.’” Rooted in the idea of *response*, which, taken

literally, means “a quick and positive reaction,” responsive teaching practices can be thought of as improvisations (Philip, 2019) or quick reactions to a change, or stimulus, in a teachers’ environment. Indeed, Chapter 4 documents the variety of ways the focal teachers responded to the abrupt shift to online teaching.

In this chapter, I offer a related but more nuanced conception of good teaching, which I refer to as pursuing adaptive teaching practices. Stemming from the concept of adaptive expertise (Hatano & Inagaki, 1984), *adaptive teaching practices* are those intentionally added to or selected from a teacher’s repertoire to meet the needs of their unique and changing teaching contexts. Adaptive expertise can be described as flexible and innovative and marked by the ability to extend current understandings to meet the demands of novel problems or atypical contexts (Crawford et al., 2005). This stands in contrast to what has been described as routine expertise (Hatano & Inagaki, 1984), marked by speed, efficiency, and automaticity but does not necessitate flexibility or adaptability to new situations. Importantly, adaptive expertise represents a *stance* on teaching knowledge and practice: adaptive experts approach new situations flexibly and learn throughout their lifetimes (Bransford et al., 2000). Furthermore, adaptive expertise is not only a way to describe how teachers have changed their practice, but it also motivates their learning, as they recognize when rules and principles do not apply to situations, seeking instead to develop new practices (Gott et al., 1996).

Rather than cast teachers as adaptive experts or not — which feeds into problematic notions of “good” and “bad” teachers — I instead submit an exploration of adaptive teaching practices. A core characteristic of adaptive expertise is that adaptive experts continually build repertoires of practice that they can then select from as they encounter new scenarios. An investigation into teachers’ adaptive teaching practices may shed light on how teachers build

such repertoires and the reasons they may select, discard, or develop certain teaching practices as they encounter certain contexts.

5.2 Responsive and Adaptive Teaching in the Literature

To better understand teacher responsiveness and adaptive teaching, I first turn to the literature on responsive and adaptive teaching practices. Responsive teaching has most commonly been used as a construct by scholars of *culturally responsive teaching* to describe teachers who respond to the ecological factors of their work — prior experiences, community settings, cultural backgrounds, as well as the racial and ethnic identities of teachers and students — in pursuit of effective teaching (Gay, 2018). Others have extended the notion of culturally responsive teaching to describe *linguistically responsive teaching* in which teachers respond specifically to students labeled as English Language Learners' full linguistic resources (Lucas & Grinberg, 2008). These related applications of responsive teaching suggest long-term engagement; that is, a culturally or linguistically responsive teacher works over time to incorporate teaching practices that attend to such ecological dynamics.

In contrast, the stand-alone term *responsive teaching* is typically used to describe when teachers respond to students' ideas in the moment (e.g., Felton et al., 2022; Flood et al., 2020; Jaber et al., 2022; Robertson et al., 2015). Along similar lines, *adaptive teaching* is commonly used to describe the unplanned adjustments or maneuvers teachers make to their practice to meet individual students' needs (e.g., Allen et al., 2016; Gallagher et al., 2022; Prediger, 2022). These descriptions imply a sense of immediacy; a responsive or adaptive teacher changes their practice in the moment as students' ideas and needs are uncovered.

It is clear from this extensive body of work that responsiveness and adaptation are core phenomena in teaching and learning, and it is unsurprising that it has been taken up by scholars in so many different ways. Building from this work, conceptualizing good teaching as the pursuit of adaptive teaching practices expands the unit of analysis to explore the particular reasons for teachers' responsiveness. Furthermore, analyzing teachers' adaptive teaching practices helps us to move away from the idea of good teaching as an accumulation of best practices, instead inviting us to consider how teachers select and refine their practices in response to environmental changes, with a focus on teachers' pedagogical judgments (Horn, 2020).

5.3 Pedagogical Judgment in Pursuit of Adaptive Teaching Practices

As described in Chapter 1, researchers and teacher educators should attend to teachers' pedagogical judgment. *Pedagogical judgment* is a form of teacher sensemaking comprised of (1) pedagogical action supported by (2) pedagogical reasoning and rooted in (3) pedagogical responsibility (Horn, 2020). In Chapter 3, I highlighted the ways the teachers in this study negotiated or navigated their pedagogical responsibilities as they made pedagogical judgments in their figured worlds of pandemic teaching. In this chapter, I extend this work by examining the relationship between teachers' pedagogical reasoning and their adaptive teaching practices, offering a more complete understanding of the focal teachers' pedagogical judgments.

5.3.1 Understanding Adaptive Teaching Practices Through the Lens of Pedagogical Action and Pedagogical Reasoning

In Horn's (2020) conception of pedagogical judgment, she defines *pedagogical action* as "the choices teachers make, intentional or not, in their role as a teacher, during or outside of classroom instruction" (p. 325). In this chapter, I will focus on the intentional choices teachers

made as they returned to the classroom for the 2021-2022 and 2022-2023 school years. Specifically, I will examine teachers’ choices to *revisit* old teaching practices, *take up* new teaching practices, and *bench* current teaching practices (see Table 5.1). Revisited teaching practices are old practices that teachers may have previously discarded but intentionally take up again, or revisit, to meet the needs of their current teaching contexts. New teaching practices are those that teachers begin to implement but have not used before. Teachers may hear or learn about a new practice in professional learning settings, through their social or professional networks, from a book or conversations with colleagues, or have known about it for a while and just recently decided to take it up. Lastly, by “bench,” I refer to a common sports term for taking a player out of play. The idea of “benching” has come to be used more colloquially to refer to temporarily pausing the use of something; when a teacher benches a teaching practice, they may not be using it as a part of their regular practice but instead are temporarily pausing its use until their teaching context calls for it again.

Teaching Practices (Pedagogical Actions)		
Revisited	New	Benched
Old practices that teachers may have previously discarded but take up again	Practices teachers add to their repertoire	Current practices that teachers pause use of

Table 5.1: Three Domains of Teachers’ Intentional Pedagogical Actions

Teachers have different interpretations or rationales for their pedagogical actions — what Horn (2020) refers to as their *pedagogical reasoning*. As teachers engage in pedagogical reasoning, they respond to their teaching context and adapt their teaching accordingly — by

revisiting old teaching practices, taking up new teaching practices, or benching current teaching practices — in a process of adaptive teaching.

5.4 Adaptive Teaching in a “Post-” Pandemic World⁵

To investigate RQ3, I listed the changes teachers made to their practice during online teaching and investigated which of those practices the teachers had sustained in the two school years since returning to the classroom. Comparative analysis (Boeije, 2002) of teachers’ interviews from June 2021 and November 2022 revealed that the answer was more complex than I had designed for, and a pattern of pedagogical reasoning emerged.

5.4.1 Emerging Spectrum of Teachers’ Pedagogical Reasoning

Consistent with my situated and organizational conception of good teaching outlined in Chapter 1, I examined the different conditions teachers described adapting for, revealing a spectrum of pedagogical reasoning from organizationally-, personally-, or institutionally- (OPI) centered to student-centered (see Figure 5.2). For example, teachers described changing their teaching in response to attending a professional development session or teaching different courses. I conceptualize this response as *OPI-centered* because the impetus to adapt was rooted in an organizational, personal, or institutional condition and not in response to their students. In contrast, other teachers described making choices regarding their teaching in response to specific student dispositions, like quiet students or distracted students. I consider such responses to be *student-centered* because they are grounded in the needs of their students and not other personal,

⁵ I recognize that we are not yet (or may ever be) in a post-pandemic world; at the time the data for this chapter was collected, the 7-day average of U.S. deaths related to COVID-19 was spiking to nearly 2,000 people. The scare quote-enhanced term “*Post-”Pandemic World* is my attempt to describe the time in teachers’ lives after remote teaching while emphasizing the unattainability of a world without COVID-19.

organizational, or institutional factors. Figure 5.2 shows all the conditions that the focal teachers described responding to mapped onto a spectrum from OPI-centered to student-centered reasons for changing their practices.

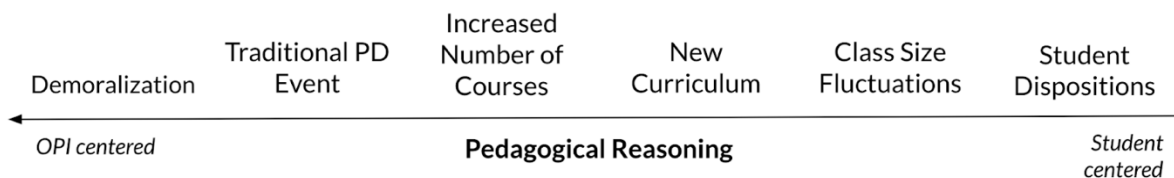


Figure 5.2: Mapping Teachers' Conditions Along a Spectrum of Pedagogical Reasoning

I intentionally represent teachers' pedagogical reasoning on a spectrum and not in discrete categories of OPI-centered and student-centered for a few reasons. First, avoiding a simple binary categorization reflects my framing of good teaching as a wicked problem and highlights the contextual nature of teachers' pedagogical reasoning. Consider a teacher that attributes changing their groupwork monitoring style to having a larger-than-typical class size. This change may be so they can listen to more students' mathematical understandings, suggesting that *larger class size* is a condition that necessitates student-centered pedagogical reasoning. However, the same teacher may start assigning multiple-choice assessments because they do not have time to grade a large number of individual student responses. In this scenario, the same condition — larger class size — would spur a more organizational line of pedagogical reasoning. Disentangling teachers' professional conditions, pedagogical reasoning, and pedagogical actions would be a fruitless endeavor; instead, representing their relationship in this way opens opportunities for a more nuanced understanding of teachers' pedagogical judgments.

Second, I introduce a spectrum of pedagogical reasoning to push back against evaluative notions of “good” or “bad” reasons for teachers' pedagogical actions. Importantly, teachers may

engage in pedagogical reasoning in ways that do not center students and yet are still valid. For example, a teacher may take up a new practice because they were told to at a traditional professional development event, not because they felt it was what was best for their students, pointing to an institutional line of pedagogical reasoning. As described above, responsive and adaptive teaching practices are largely discussed in relation to students' cultures, language, and in-the-moment ideas. Expanding our conception of responsiveness from *Is a teacher responsive or not?* to *What conditions is a teacher responding to?* and *How centered are students in their reasoning?* may help researchers and designers of learning experiences understand why teachers may not be taking up a practice in its intended way.

5.4.2 A Typology of Adaptive Teaching Practices

As I organized teachers' responses to Interview 6 questions along a spectrum of pedagogical reasoning, three main categories of adaptive teaching practices emerged: revisiting old practices, taking up new practices, and benching current practices (see Figure 5.3). For each type in the table, I included the names of the focal teachers based on the adaptive teaching practices they described in Interview 6. Some teachers appear in multiple categories because they discussed changing multiple teaching practices and offered a variety of reasons for their changes.

As I have described in Chapter 2, the teachers in this study are inclined toward reflection and committed to ambitious and equitable mathematics instruction. Thus, this sample is not intended to be representative of all teachers and likely over-represents teachers engaged in student-centered pedagogical reasoning. Speaking to the distribution of U.S. teachers' practices within this typology is outside of the scope of this dissertation; I simply offer it as an

organizational tool for understanding teachers’ pedagogical judgments as they pursue adaptive teaching practices. However, it is worth investigating, whether or not it is representative, since student-centered pedagogy is the aim of many educational reforms that aim for equity.

		Teaching Practices (Pedagogical Actions)		
		Revisited	New	Benched
Pedagogical Reasoning	OPI Centered	Old practices that teachers revisit for to organizational, personal, or institutional reasons	Practices teachers take up for to organizational, personal, or institutional reasons	Current practices that teachers pause use of for organizational, personal, or institutional reasons
		<i>Ezio</i>	<i>Brad, Kasey</i>	<i>Jason, Ezio, Kasey</i>
		Old practices that teachers revisit in response to student needs	Practices teachers take up in response to student needs	Current practices that teachers pause use of in response to student needs
	Student Centered	<i>Kirsten, Amber, Jasmine, Jason, Kasey</i>	<i>Jasmine, Amber, Ezio, Kirsten</i>	<i>Amber, Jasmine</i>

Note. The names in bold lettering are the focal teachers that are highlighted in each section.

Figure 5.3: Typology of Adaptive Teaching Practices

In the remainder of this chapter, I will use this typology to explore the relationship between the focal teachers’ pedagogical actions and their pedagogical reasoning as they pursued adaptive teaching practices in their “post-” pandemic worlds. Specifically, I will discuss the ways teachers engaged their pedagogical judgments in pursuit of adaptive teaching practices within each of the six categories within this typology. For each type, I highlight one focal teacher’s experiences to anchor the subsequent discussion.

5.5 Revisiting Old Teaching Practices

When teachers pursue adaptive teaching practices, they exercise their pedagogical judgment to select practices from their repertoires that meet the needs of their specific teaching contexts. In some cases, the most salient practices are ones that teachers have not used regularly. In this section, I analyze two teachers who both described revisiting an old practice — whole-class instruction — for very different reasons.

5.5.1 Revisiting Practices for Student-Centered Reasons: Whole-Class Discussions to Build Students' Confidence

Last year I had to adjust my teaching. I wish it could have been more personalized to help with those students. But to be honest, it was a lot of more than just content knowledge, but to build up their confidence again. So it had to be a lot of whole-class instruction. Students wouldn't start unless I started with them. And now this year, it's starting to pick up again where it feels like I can have students work in groups. They're socializing more. They're interacting with their classmates more. They're getting used to asking for help and not feeling helpless anymore.

-Kirsten Nagi, Interview 6, November 2022

Kirsten Nagi, a high school teacher, described adjusting her teaching to include whole-class instruction to help build her students' confidence. In her interviews, Kirsten described primarily drawing on groupwork and exploratory teaching practices before the pandemic. In this quote, she described revisiting whole-class instruction as she returned to the classroom after a year of online teaching. As she reasoned about this pedagogical choice, she described needing to build up her students' confidence after observing the ways her students would not start a task

independently. In this way, her reasoning for revisiting whole-class instruction is on the student-centered side of the spectrum; she selected the practice from her repertoire to meet the needs of her unconfident students so they could access the mathematics.

Direct instruction has fallen out of favor for researchers that try to pinpoint best teaching practices (e.g., Boaler, 2002) and is hardly considered an effective way to teach responsively by most stakeholders in the field. However, by shifting the analysis from the practice itself to the pedagogical reasoning behind it, this example shows how Kirsten was teaching adaptively in a way that responded to her students' needs.

Other teachers in this study reported revisiting old practices for similarly student-centered reasons in the wake of virtual schooling. For example, Amber described assigning student roles during groupwork in response to noticing her students' under-socialization, and she explained she had not used group roles since she first started using groupwork. Jason reported providing step-by-step solutions to math problems, a practice he had moved away from in favor of teaching practices that better fostered students' critical thinking skills. As he reasoned about this change, he described a need to address student gaps in mathematical content knowledge that emerged from a full year of online teaching. These examples show that for adaptive teachers, revisiting old practices is not uncommon. Furthermore, teaching practices that may on the surface seem teacher-centered may be based on student-centered reasoning.

5.5.2 Revisiting Practices for OPI-Centered Reasons: Lectures as a Way of Survival

So, before we were Zooming, I had made a lot of changes to the way I teach compared to how I was originally as a teacher. Ever since we've come back, I'm more like-- I'm teaching the way I used to when I first started teaching. Lecturing all the time, talking too much, it's too

teacher-centered. Even for me, transitioning back to how I was before COVID has been hard for me as well. I noticed. I'm doing a lot of things that I thought I had changed, and I'm like, no, I've reverted back to the teacher I didn't want to be. So just the routines that I had as a teacher right before COVID, I forgot it all, and I'm still trying. And it's been a year. It's been over a year, and I'm still trying to figure out, well, how did I do this? How did I do that? [...] I'm struggling just to survive in my own classroom.

-Ezio Martín, Interview 6, November 2022

Ezio Martín, a middle school mathematics teacher, revisited lecturing as a way to survive his experience of demoralization (Santoro, 2018). In this quote, Ezio clearly describes lecturing as “teaching the way he used to,” signifying that he is revisiting an old practice. However, unlike Kirsten, his reasoning for returning to lecture-style teaching practices is rooted in his institutional and personal experiences. In his member-check interview, he talks about “feeling old” and “thinking about retiring” for the first time in his career due to what he describes as burnout.

I do not include Ezio’s experience as a contrast to Kirsten’s in what could be interpreted as “bad” or “less valid” reasoning for lecturing students. To the contrary, I share this quote to validate his pedagogical reasoning. As a reflective teacher, Ezio describes “still trying,” asking himself, “How did I do this?” and, “How do I do that?” in reference to teaching practices that would be considered more student-centered, yet still feeling like he was falling short of being the teacher he wants to be. Eliciting teachers’ reasoning for revisiting old practices can shed light on the organizational and institutional constraints they are experiencing, further complicating what it means to be an adaptive teacher.

5.6 Taking Up New Teaching Practices

Most research on teacher learning and teaching practices focuses on the conditions under which teachers take up and sustain new teaching practices, conflating *teacher learning* with *implementing a new practice*. For example, consider Teacher 1, who learned about groupwork at a conference and arranged their classroom with desks in groups the next school day. However, Teacher 1 did not yet understand how to support their students to work in groups, select group-worthy tasks, or monitor students' progress throughout the lesson in a meaningful way. This teacher was implementing a new practice — groupwork — but had not yet learned the nuances of teaching with groupwork in ways that make it responsive and effective.

Similarly, consider Teacher 2, who learned about groupwork at a different conference. This teacher walked away from their session on groupwork with a deep understanding of the ways they may need to adjust their practice to support students' collaborative learning. Yet, when they returned to their classroom, they had just a few weeks before their students took the state standardized test, the scores of which would be factored into the teacher's evaluation. Feeling pressed for time, Teacher 2 was not able to introduce groupwork to her students and foster collaborative learning in a meaningful way while covering all the standards on the exam. This teacher, in contrast to Teacher 1, had learned a new practice, yet was unable to implement it in a way that would indicate she had learned it.

In this section, I will show that adaptive teaching is not as straightforward as simply accumulating more teaching practices and applying them to every teaching context. I offer a more nuanced examination of teachers' pedagogical reasoning by highlighting two teachers and their experiences adding new teaching practices to their repertoires.

5.6.1 Taking Up New Practices for Student-Centered Reasons: Random Student Grouping to Foster Student Talk

[I started using random student grouping] just to get them to talk more, because last year, maybe one day, it just turned out that they weren't talking as much and so I decided to— for instance, I'll be like, okay— if they're at tables of four, then it's like, “Okay, the person sitting in this corner, you guys are going to rotate how many spaces over.” And then everyone has to move somewhere. And so I keep doing that and doing that and doing that. So it's definitely a lot more movement, a lot more randomization compared to before.

-Jasmine Lin, Interview 6, November 2022

Jasmine Lin, a high school teacher, incorporated random student grouping as a core teaching practice for the first time after returning to the classroom. While Jasmine had been exposed to the idea of random student groups through the PDO, she didn't implement them until this moment in her teaching when she felt that students' dispositions necessitated it. Important to the teacher change discourse, Jasmine's pedagogical reasoning for adding a new practice to her repertoire is student-centered, pointing toward her pursuit of adaptive teaching practices in response to changes in her teaching context — in this case, her students' inclination to talk to each other.

Other focal teachers reported taking up new practices to meet the needs of their students. For example, Amber began hosting all of her lesson materials online so that absent students could more easily access the material. Ezio explained that he started modifying his tasks to have a lower floor so that students that come in with content knowledge gaps can still work independently. These teachers' pedagogical reasoning is in response to student-centered conditions: chronically absent students and students with content knowledge gaps, showing the

diverse range of conditions teachers are faced with, even just on the student-centered side of the spectrum, and the ways they adapt to meet them.

5.6.2 Taking Up New Practices for OPI-Centered Reasons: Vertical Whiteboards to Fulfill Professional Development Homework

So there were a couple of other teachers at my school that had gone through this PD. It's through our district, actually. It's like, "sign up for this PD!" [...] So the homework is to choose at least one micro and one macro move to implement. And then we have to take pictures or submit evidence of us doing it and write about it, and then also write about ones that we thought about but didn't try and why we didn't try them. And so that's the motivation of like, you can't just read a book and be like, those are some good ideas.

-Brad Miller, Interview 6, November 2022

Brad Miller, a high school teacher, moved cities (and school districts) between Interview 5 in June 2021 and Interview 6 in November 2022. As part of his new district's PD offerings, he joined a book club to read *Building Thinking Classrooms* (Liljedahl, 2020). Prior to reading the book, he described "never using vertical whiteboards," but that as part of the PD, his "homework" had been to choose a move from the book to implement and submit evidence of its implementation. In this sense, his reasoning behind taking up a new teaching practice was rooted in institutional notions of teacher learning and surveillance. When I prompted him to share his pedagogical reasoning about using vertical whiteboards in connection to his students, he said:

I do think I need to talk to the kids more and kind of get a sense of— I did give them an end-of-trimester huge course evaluation. But I didn't ask them explicitly, "What do you think about the vertical whiteboards?" [...] So that's something that I think that I should do (*Interview 6, November 2020*).

In this excerpt, Brad admits that he had yet to reason about this new practice in a way that centered his students, further showing the ways that his pedagogical reasoning for taking up a new teaching practice was institutionally-centered.

Both random student grouping and vertical whiteboards are generally included in the discourse on best practices within the mathematics education community in general and the PDO in particular, and yet the examples of Jasmine and Brad complicate what it means for teachers to add practices to their repertoires. From a teacher change perspective, both Brad and Jasmine made a change to their teaching by implementing a new strategy known for fostering student engagement. Yet, upon deeper analysis of their pedagogical reasonings, each teacher pursued adaptive teaching practices for markedly different reasons.

5.7 Benching Existing Teaching Practices

The literature on teacher learning is eclipsed by research on the practices that teachers *do* in their classrooms and rarely focuses on the reasons teachers may choose *not* to do something. In this analysis, I broaden such an action-oriented conception of teacher learning to include the times when teachers do not do certain practices. In adaptive teaching, teachers engage their pedagogical judgments as they select from and refine their repertoires of practice in response to changes in their teaching contexts. Adaptive teachers do not simply accumulate additional practices; instead, they integrate them into an instructional ecology, sometimes recognizing that a particular teaching practice no longer meets the demands of their new contexts, leading them to bench it until it becomes useful again.

5.7.1 Benching Practices for Student-Centered Reasons: Discarding Desmos Lessons to Address Student Distractions

Thinking about the kids– there's just– like this era is socially very different [...] There's so much technology– like when we were online it was like, “Oh God, how do we put everything digital?” Because that's the only way that we're reaching them [...] I've seen how quick they are with changing their tabs and all this stuff. And you can tell they're so distracted. Some of the kids I have are like fidgety where, like, if they don't have their computer, it's like a thing. So I'm trying to get them actually off of the technology while also they need to use it as a tool. But it's different than the kids that I had before this. I'm just noticing way more– almost just like attention span things, or like an instant gratification is also needed– and just different sort of pieces like that.

-Amber Singleton, Interview 6, November 2022

Amber Singleton, a high school teacher, was a huge advocate of Desmos lessons during online teaching because of the ways they enabled her to engage students. She even pushed for her school to purchase the Algebra 2 Desmos curriculum for the 2022-2023 school year. However, when she started implementing the same Desmos lessons in her classroom as she had online, she noticed that her students were showing signs of distraction, prompting her to stop using Desmos and instead planning her lessons around paper and pencil tasks. Amber's pedagogical reasoning for benching her Desmos lessons was student-centered, since it was in response to her students' dispositions.

5.7.2 Benching Practices for OPI-Centered Reasons: Moving Away from Mastery Grading to Fit New Courses

I definitely haven't [continued gamer grading]. Now, that I'm thinking about it, part of it was last year having all AP courses. Neither [gamer grading or mastery grading] fit as well, I

feel like, with the AP courses. But hearing that now, I had thought earlier this year about what I did with my IM 2 class during distance learning where I was focusing on a unit a week. And this is the one topic for this week. And we'll have a quiz at the end of the week. I feel like if I had done that this year with my IM 2 class, they might have made scholars more successful in it [...] But that's something that I didn't really implement coming back to the classroom.

-Jason Schulte, Interview 6, November 2022

As described in Chapter 4, Jason took up a new method of grading, which he referred to as “gamer grading,” during online teaching. However, when he returned to the classroom, the courses that he taught changed due to teacher shortages and absences; instead of teaching a variety of lower-level, integrated math courses, Jason taught exclusively Advanced Placement (AP) courses. As a result, Jason stopped using gamer grading because he felt that it did not “fit” with the AP curriculum. In other words, Jason’s pedagogical reasoning was organizationally-centered, as he responded to a change in course load with a shift in his teaching practices.

As his course schedule changed again the next year, Jason recognized that his students may have responded better to gamer grading and considered re-implementing it into his practice moving forward. This context is important to understand the idea of benching a practice and the adaptive nature of teaching; just as teachers may have different reasons for adding a teaching practice, they may also have different reasons for discontinuing a teaching practice. In adaptive teaching, those pedagogical reasons are contextual, and as teachers’ contexts change, their practices may also change by revisiting a practice they had previously discarded.

The experiences of Amber and Jason point to the importance of attending to the practices that teachers bench in their pursuit of adaptive teaching. A simplistic explanation of when

teachers discard certain teaching practices could be that they are bad or ineffective practices, but that view reflects the simplistic notion that teaching is a technical problem. By instead examining teachers' pedagogical reasoning as they make judgments about what teaching practices are effective for their unique contexts, researchers can tease out the organizational- or student-centered conditions that adaptive teachers respond to.

5.8 Discussion

In this chapter, I explored the relationship between teachers' pedagogical actions and pedagogical reasoning as they engaged their pedagogical judgment in pursuit of adaptive teaching practices. By grounding this analysis in a typology of adaptive teaching, I aimed to account for institutional, organizational, and student-centered changes to teachers' contexts to better understand the nuances of good teaching. Specifically, this typology helps to disentangle the ideas of novelty from responsiveness; teachers can use their pedagogical judgments to respond to students, tapping into their repertoires of practices as they enact their conceptions of good teaching.

To model the typology of adaptive teaching, I highlighted the experiences of six teachers in this study. Ezio and Kirsten both revisited whole-class instruction as a teaching practice, necessitating a further analysis of the pedagogical reasoning behind each teacher's adjustment. Furthermore, contrasting Ezio and Kirsten highlight that both institutional conditions and demoralization contribute to teachers' pedagogical judgments. Similarly, while both Jasmine and Brad took up new teaching practices that are considered to be student-centered, best practices, their reasons for doing so differed. Organizing their pedagogical reasoning along a spectrum of student-centered to OPI-centered shed light on the different conditions they responded to as they

made such adjustments. Lastly, the experiences of Amber and Jason point to the importance of researchers of teacher learning and teacher educators to attend to the practices that teachers discard. Understanding teachers' pedagogical reasoning for benching particular teaching practices at particular times helps us to gain a more nuanced — and accurate — view of teacher change.

As described in Chapter 1, current research shows that teachers' own judgments matter in what they are learning as they strive to improve their teaching. Yet, giving teachers unguided discretion could lead to other systemic problems, such as biased teaching practices. By subtly shifting an analytic lens from responsive teaching practices to the student-centeredness of teachers' pedagogical reasoning about their practices, this chapter offers a conception of pedagogical judgment that may help us to further our understanding of teacher discretion while avoiding falling into a pre-NCLB-era pattern of an instructional free-for-all.

The findings of this chapter suggest that research, policy, and public discourse may be more successful in their endeavors if they address ways to encourage teachers to shift their pedagogical reasoning to more student-centered ways. Importantly, as the experiences of Ezio, Brad, and Jason showed, there are often institutional and organizational barriers to such a project that cannot be ignored.

CHAPTER 6

Discussion: Designing for Teacher Resiliency

“I think that students in large part need teachers in person. I think that if anything came out of this, I’m very happy to know that we make a difference. Kids need a teacher. I think that is a physical teacher who was going to be there every day and be able to assess their needs and diagnose them and work with them.”

–Brad Miller, high school mathematics teacher, June 2021

In this dissertation, I explored how well-resourced, experienced mathematics teachers developed responsive practices during the COVID-19 pandemic. Drawing from crisis theory, I theorize this study as a case of place-based resiliency: the social geography of the teachers in this study serves as a critical source to examine the conditions under which they felt supported, contributing to the development of pedagogical judgment. In Chapter 3, I investigated the ways that teachers’ institutional commitments shifted at the onset of emergency online teaching, unearthing possibilities for teacher agency within the bounds of three authoring spaces: structuring time, content, and grading. Specifically, I found that teachers reorganized their ethical commitments to care, asserted relational agency while drawing on their pedagogical responsibilities as they made content decisions, and negotiated their pedagogical responsibilities to reorganize their intentions to conventional grading.

In Chapter 4, I identified teachers’ adjustment to practice and related visions of good teaching to examine the relationship between teachers’ visions of good teaching and their agency to recreate their practice (or not). I found three patterns of responsiveness — tinkering, tipping

points, and survival — that contribute to our understanding of the catalysts and barriers to teacher change. In Chapter 5, I introduced a typology of adaptive teaching practices along a spectrum of pedagogical reasoning, expanding our conception of teacher responsiveness to include institutional, organizational, and personal conditions. With this typology, I push back on the conflation of novelty and responsiveness in discussions of teacher learning.

6.1 Limitations of the Study

Studying teaching and learning during the COVID-19 pandemic presents a unique set of limitations. First, this study took place during a time of crisis, suggesting that its findings may not be replicated in subsequent studies because of the unique conditions of the COVID-19 pandemic. Second, the unique sample — specifically that this study’s participants represent a best-case sample of resiliency — presents several limitations for generalization. This study captured the experiences of only seven teachers across one geographical region of the country, making it impossible to make claims about all teachers given this study’s findings. The teachers in this study self-selected to participate, resulting in a specific type of sample that had the time and the energy to add many hours of interviews to their schedules; the teachers in this study did not have substantial caregiving responsibilities, they did not frequently move between online, hybrid, and in-person teaching, and they had previously demonstrated high levels of commitment to their profession due to their participation in the PDO. The teacher experiences that this study captured were not typical of U.S. teachers’ experiences as a whole (Bartlett et al., 2021).

Yet, in some ways, these limitations also inform the implications of this study for research and practice. Because this is a case of place-based resiliency, it opens a conversation into what designing a system for teacher resiliency that transcends disaster settings may look like. Specifically, I offer a lens into the institutional and personal conditions that contributed to

experienced mathematics teachers' ongoing learning and responsiveness. A better understanding of how these conditions shape instructional practice can help researchers, policymakers, and designers of teacher learning experiences better support teachers in the future and reimagine the design of teachers' work.

6.2 Implications for Research and Practice

Imagine a country in which the experiences of this study's teachers *were* typical. Perhaps district leaders and policymakers would loosen their hold, lifting some of the institutional obligations that teachers currently experience, as in Chapter 3. Teacher change may be approached through the lens of their identities and existing visions of good teaching, uncovering explanations of teacher resistance, as in Chapter 4. Conversations around teacher responsiveness would start to include their institutional, organizational, and personal conditions, broadening our conception of what it means to be responsive, as in Chapter 5.

At its core, this study is an exploration of teacher responsiveness. Its findings raise the question: What are teachers responding *to*? Other teachers across the country at this time were responding to the whiplash they felt moving from online teaching to different versions of hybrid teaching every few weeks, or to their childcare options being ripped away from them as daycares and preschools shuttered. The teachers in this study were freed of many of the shackles of institutional demands, instead responding to their students' needs and drawing on their pedagogical responsibilities as they consistently strove to be good teachers. In other words, the teachers in this study prioritized their commitment to their students by acknowledging and responding to their needs in ways that broke through traditional notions of bureaucracy, suggesting that attending to teachers' pedagogical judgments is crucial to the study of teacher responsiveness.

The question of what teachers are responding to also further reveals the wickedness of the problem of good teaching. COVID-19 left the state of U.S. education in peril fueled by panic from test scores that show “learning loss,” increased rates of anxiety and depression among school-aged children (Racine et al., 2021), and a mass exodus of teachers from the profession (Schmitt & deCourcy, 2022). The teachers that remain are immersed in a system still reeling from the splintered response to the pandemic such that a one-size-fits-all solution to these problems will not work. As Lake and Pillow (2022) describe, “diverse needs demand diverse solutions that are informed by pandemic experiences,” this study serves as a crucial documentation of one set of teachers’ pandemic experiences. From these teachers, we can imagine solutions to the diverse needs of U.S. students that include institutional support in the form of looser coupling between policymakers and teachers, attention to teachers’ identities in pursuit of teacher change, and professional learning experiences grounded in an expanded conception of teacher responsiveness.

Additionally, this study contributes methodologically with a novel interviewing design: reflexive longitudinal lifeworld interviewing. With this interview design, researchers will be able to follow participants’ emerging understandings of events unfolding in real time. Combining lifeworld interviews with ongoing ethnomethodological analysis, this approach captures individuals’ experiences in a novel way that can not only contribute to other studies of crisis response but recognizes the ever-changing world of teaching.

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Appendix

Interview 1 Protocol

1. How are you doing?
 2. What courses were you teaching during the in-person portion of the school year? *Probe: Do you teach AP courses?*
 - a. What courses are you teaching remotely?
 - b. Can you describe what that transition was like?
 3. What went through your mind when you received the news that schools were closing? *(Note: Think in context of getting pulled up short.)*
 - a. Can you remember any specific emotions or feelings you felt?
 - b. How do you feel about schools being closed now?
 4. What are the official expectations your school has given for teachers since schools have been closed?
 - a. How have these expectations been communicated to you? *(Probes: Who communicated, via what medium, any PD support)*
 - b. Have these expectations changed since schools were first closed in March?
 5. How have you primarily communicated with your students?
 - a. Do you have students who haven't checked in?
 - i. That do you know about those students?
 - ii. Are there any patterns in the groups of students who haven't checked in? (e.g., ELL students, students who do a lot of caregiving for siblings, etc.)
 6. What is a typical day like for you right now? *Probe for how teachers are balancing families, work space, sleep, students (or lack of communication with students).*
 - a. *If partner:* Is your partner also working at home? What has that experience been like?
 - b. *If kids:* How old are your children? How many children do you have? What are the expectations for their schooling?
 - c. *If kids with partner:* How do you and your partner divvy up caregiving/homeschooling responsibilities?
 7. What has changed the most about how you plan?
 - a. Can you give me an example of/tell me about a lesson you taught recently? *Elicit specific stories.*
 - i. Have you previously taught this lesson face to face?
 - ii. How did you adapt this lesson for teaching online?
 - iii. How did you know when kids learned when you were in the classroom?
 - iv. How did you check for understanding online?
- Listen for dilemmas and probe teachers to elaborate/provide descriptions or examples.*
8. What support has your school offered? *Probe for specifics - curriculum support, coaching support, team meetings, etc.*
 1. Where else have you sought support?
 2. What has been the most helpful? *Probe for specific examples and why they were helpful.*
 3. Is there anything you feel like you could still use support with? *Probe for specific examples.*
 4. What is something you feel like you're doing well?

5. Has anyone reached out to you for support?
9. Do you think your classroom teaching will change as a result of your experiences creating and teaching lessons online?
10. What is your primary goal for (your students during) online learning right now?
 1. How has this goal changed (or not) from your goals of in-person learning?
11. What are some of your concerns right now?
 1. *If AP teacher:* Are you concerned about this year's online AP test?
12. If you had to summarize your emotions regarding this entire experience of living through a pandemic and teaching remotely in one word, what would it be?
13. Is there anything you were hoping to talk about that I didn't ask you about?

Interview 2 Protocol

BEFORE START OF SCHOOL

1. How was your summer? How did you spend it?
 1. Did you spend any time planning for the school year? [*How much time?*]
 2. What did that planning look like?
2. When did you start planning for the school year?
 1. What did that look like?
 - i. How much was spent on curriculum/lesson planning, learning technology, seeking out resources for online teaching?
 2. Have you reached out for support from colleagues, MfA, or friends?
3. Has your school offered or mandated any PD?
 1. What PD has been offered? (Get a list)
 2. Can you give an example of one that you found most helpful? (Walk through one example)
4. What went through your mind when you received the news that schools were beginning remotely? (July 13)
 1. Can you remember any specific emotions or feelings you felt?
5. What are some of your concerns right now?

Probes:

 - a. Relationships
 - b. Tech access
 - c. Tech support/teaching kids to use Google Classroom/Zoom

SCHOOL-SPECIFIC POLICIES

6. What courses are you teaching this year? *Probe: Do you teach AP courses?*
 1. How many students will you have per class, on average?
 2. How many total students will you have?
7. What are the official expectations your school has given for teachers this school year?
 1. What does your school require in terms of time teaching, asynchronous vs. synchronous learning, and content?
 2. How are you handling grades?
 - i. Is this different from the spring?
8. How are you making decisions regarding content?
 1. How have these expectations been communicated to you? (*Probes: Who communicated, via what medium, any PD support*)

2. What are the official expectations your school has given for students this school year?
9. How are you planning to/how are you primarily communicate(ing) with your students?
 1. What are the structures in place for students who don't show?
 2. In what ways does this differ from the spring? What informed those differences?
10. What supports and structures has your school put in place for students who are on an IEP or 504?

CURRENT TEACHING PRACTICES

11. What has changed the most about how you plan from in person teaching? From the spring?
 1. What is the breakdown of your time allocation (content/tech/attendance)?
 2. Are you using breakout rooms?
 3. Can you give me an example of/tell me about a lesson you are currently planning or have planned recently? *Elicit specific stories.*
 - i. Have you previously taught this lesson face to face?
 - ii. How did you adapt this lesson for teaching online?
 - iii. How are you planning on checking for understanding online?

Listen for dilemmas and probe teachers to elaborate/provide descriptions or examples.
12. What is your primary goal for (your students during) online learning right now?
 1. How has this goal changed (or not) from your goals of in-person learning?
13. What are you excited about?

TEACHER LEARNING

14. What support has your school offered? *Probe for specifics - curriculum support, coaching support, team meetings, etc.*
 1. Where else have you sought support?
 2. What has been the most helpful? *Probe for specific examples and why they were helpful.*
 3. Is there anything you feel like you could still use support with? *Probe for specific examples.*
 4. What is something you feel like you're doing well or are excited for?
 5. Has anyone reached out to you for support?
15. What did you learn in the spring that is informing how you teach or prepare for this fall?

TEACHER EMOTIONS

16. If you had to summarize your emotions regarding this entire experience of starting a new school year teaching remotely, what would it be?
17. Is there anything you were hoping to talk about that I didn't ask you about?

Interview 3 Protocol

Interview Invitation Asks

- *Current teaching schedule (what does a week look like)?*
 - *Artifact from a lesson that you felt good about (e.g., lesson plan, link to an activity, etc.)*
1. Check in: How is it going? (On a scale of 1-10, how much stress do you feel most days? How has that changed over time?)
 1. *Probe for personal vs professional stress*

2. What are the three most important goals for your teaching right now?
 1. How do you balance those goals?
3. What does it mean to be a good teacher right now?
 1. Have your ideas about what being a good teacher looks like had to change this year? In what ways?

LESSON PLANNING

4. What is the breakdown (percentages) in your allocation of time spent working right now? (*Planning, digitizing, instruction, meetings, grading, email*)
 1. Has that been pretty consistent throughout the year? Has it changed? If so, how?
5. How has lesson planning been going?
 1. What is the most challenging part of lesson planning?
 2. *Probe: Have you been collaborating with colleagues on this?*
6. Has the nature of your collaboration with teachers changed? In what ways?
 1. *Probe: New? Different? Better?*
 2. *Probe: School-based teachers? MfA teachers? Twitter/facebook/social media groups?*
7. What are the primary online resources that you use in your teaching? *Probe:*
 1. *What are the benefits that these resources offer that you like?*
 2. *Which do you find most helpful?*
 3. *Will you continue using them when you go back to in-person?*

WHAT IS HAPPENING DURING TEACHING

8. What have you done (or attempted to do) to build relationships with your students this year?
 1. *Probe for specific stories of success, challenge*
 2. What do you think is missing? *Probe: what would help you meet your relationship goals?*
9. How many students show up to your live sessions?
 1. Is it consistently the same students that don't show up? Do you notice any patterns in who comes and who is absent?
 2. Are the students that don't show up still completing their work?
10. Have your kids been on camera or have they been coming to class and leaving their cameras off?
 1. What instances have you seen kids want to put their cameras on, if any?
 2. *Probe: What games/strategies/prompts do you use to support them with this?*
11. Can you describe your experiences holding whole class discussions?
 1. How does the pace/flow of conversation differ from in person discussions?
12. Are you able to use breakout rooms?
 1. What has that experience been like?
 2. What has been challenging about using them? What has been good?
13. What are the ways you've tried to support students' mathematical exploration?
 1. What hasn't worked? What has worked?
14. How are you [informally/formatively] checking for students' understanding during class?
 1. What hasn't worked? What has worked?
 2. Do you feel like you have a sense of what students know? Why or why not?
 3. Are you able to build on students' understanding during class?
15. How are you assessing students?

- 16. Describe a typical synchronous/asynchronous day for you right now.
- 17. How were decisions made about content or curriculum?
 - a. Why were they made that way?
 - b. Do you think they were the right decision?

LESSON ARTIFACT

- 18. Why did you choose to send me this artifact? What went well about this lesson? Why do you think that is?
 - a. Would you have changed anything about this lesson plan?
 - b. What lesson is it from?
 - c. When in the school year did you teach this lesson?
 - d. Is this lesson typical?
 - e. Had you used the online resources in this lesson before?

+ *Personalized interview questions*

- 19. Do you have concerns about going back to school in-person?
- 20. What do you wish you could do better?
- 21. What do you think you're doing well at?
 - 1. What do you think you've gotten good at as a result of teaching remotely?
- 22. What do you think has been (or will have been) the biggest impact of COVID-19 on your teaching career?

Interview 4 Protocol

- 1. How did you spend your break?
 - 1. Were you able to rest and relax or did you work a lot?
- 2. How is this semester going? (On a scale of 1-10, how much stress do you feel most days? How has that changed over time?)
 - 1. *Probe for personal vs professional stress*

LOCAL CONTEXT

- 3. The superintendent has stood his ground with regards to returning to in-person school. What are your thoughts on the superintendent's stance on reopening?
 - 1. What are your thoughts on hybrid teaching (especially if the rest of the year will be hybrid)?
 - 2. Has the superintendent's insistence on keeping schools closed until it is safe to go back - especially when compared to other major urban districts' responses to remote teaching - put you at ease at all?
- 4. How did the January spike in cases and hospitalizations in LA affect you or your students?

SUMMARY OF LAST INTERVIEW

Teaching	+ <i>Personalized summary</i>
Technologies	
Time Allocation	
Attendance	

Teacher Collaboration	
Breakout Rooms	
Supporting Student Exploration	
Goals for Teaching	
Successes	

5. Looking at this table, have there been any major changes since the last time we talked?
6. One of the concerns you expressed how difficult it is to follow up with students who weren't completing the work virtually vs. in person. Do you feel like you have a handle on that now?
7. In our last conversation, you mentioned how difficult it was to check for students' understanding because you couldn't see their work (only their answers). Is this still the case?
 1. You were wrestling with your time allocation - wondering if you should spend more time on formative assessments and less time 'digitizing' materials. Have you done this?

PRIMARY TECHNOLOGY

8. What would you say is the primary technology you use during class? (Probe: Desmos, Google slides, code.org, etc)
9. Can you describe the ways you use [this technology].
 1. Has the way you use [this technology] changed at all over the course of the year? In what ways?
10. What are your favorite features of [this technology]?
 1. Has [this technology] added any features since the start of remote learning that have been helpful?

FEEDBACK

11. Have you solicited feedback from your students regarding your teaching? In what ways?
 1. Have you solicited feedback from your students' families?
 2. What have you learned or changed as a result of feedback from students or families?
12. Have you gotten observed and/or been given feedback by administrators or colleagues?
 1. Can you describe that experience?
 2. Did you find feedback helpful?

ASSESSMENT ARTIFACT

1. Why did you choose to send me this assessment?
 1. When in the school year did you administer this assessment?
 2. Did you create this assessment on your own?
 3. Is this assessment typical?
 4. What are other ways you've given summative assessments?
 5. Did you find this assessment particularly successful? Why or why not?
2. How did assessment work in your school and your classroom in person?
 1. Does your school have data systems? What are they?
 2. Are you collecting and using data on your own?

3. What does the data that you (or your school) have collected say about what your students are learning?
3. What is the role of assessment during a pandemic?
 1. What do you think summative assessments actually assess?
4. What percentage of students do you have failing your class?
 1. Is this typical?
5. Compared to last year at this time, what percentage of the curriculum have you gotten to?
 1. How much of the curriculum do you think you'll get to by the end of the year?
 2. How have decisions about content - what to teach and when to teach it - been made?

CONCEPTIONS OF GOOD TEACHING

6. What is something you are currently working on getting better at?
7. What do you think you're doing well at?
 1. What do you think you've gotten good at as a result of teaching remotely?
8. What does it look like to teach math well right now?
 1. Can you think of someone that is teaching math well right now? What does that look like?
 2. Have your ideas about what being a good teacher looks like had to change this year? In what ways?

Interview 5 Protocol

1. How did the year finish out for you? (Probe: what is your school's plan for next year (schedule/start time)? What was your EOY schedule like?)

SUMMARY OF EXPERIENCE

2. What was the hardest part of your entire online teaching experience?
3. What were some good parts of your online teaching experience?
4. If the job of teaching were always remote, do you think you would be a teacher?

NEXT YEAR

5. What are you most looking forward to for next teaching year?
6. What do you think will be the hardest adjustment back into the "normal" classroom next year?
7. Is there anything you learned this year that you think you'll take back into the classroom with you? (Probe: open note tests, new technologies)

+ Personalized questions based off analysis of prior interviews

LASTING IMPACT

8. What do you think will be the biggest change to your teaching as a result of this year?
9. What does it mean to be a good math teacher?
 1. In what ways do you feel like you've been a good teacher this year?
 2. Have your ideas about what being a good teacher looks like had to change this year? In what ways?
10. What do you think some lasting after-effects of the pandemic will be in schools (- both positive and negative)? (Probe: content gaps, increased use of technology)
 1. How do you think you (and your school) will address the gaps in content knowledge incoming kids will have?

2. What has this pandemic year taught you about how we need to re-imagine your work?
3. What needs to change this fall?
4. What things have we learned in the pandemic that we should keep?
11. What do you think the biggest impact this teaching year will have on schools?
12. What do you think the biggest impact this teaching year will have on your career?
13. Is there anything else you wanted to say about this year that I didn't ask you about?

Interview 6 Protocol

1. The last time we had a formal interview was June 2021. Can you describe your experiences integrating back to classroom teaching since then? (*Listen for their experiences, challenges, frustrations, things they like, etc.*)
 1. Are you in the same teaching role/school as you were during the 2020-2021 school year?
 2. What was last school year like?
 3. What has this school year been like so far?
2. What are some differences in the schooling experience that you've noticed since returning to the classroom? (*Probe for their understandings of the reasons for the changes*)
 1. Topics to probe further for:
 1. Students
 2. Curriculum
 3. Teacher shortages
3. Recently released student test scores have predictably (and understandably) shown that students scored lower than in typical years on mathematics, feeding the narrative of learning loss. Can you speak to any such gaps in mathematical knowledge with your own students that you feel like you can attribute to the pandemic?
 1. What do you think are the primary contributors to such gaps?
 2. How do they affect your teaching?
4. Can you describe any changes to your teaching since the pandemic? (*Probes: changes in technology use; attention to social-emotional needs; content; lesson design*)
5. In our last interview in June 2021, I asked you what you learned during the online teaching year that you thought you may bring with you back into the physical classroom. You responded with:
 - + *Personalized responses from prior interviews*

Now that you've been back in the classroom for a while, can you speak to if you feel like you have made these permanent changes to your practice?

 - + *Personalized member check questions*
6. Is there anything you'd like to talk about that I didn't ask you about?

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